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Ernest L. Karlstrom

1954

Catalog

nos. 144-391

E.L. Karlstrom
1954

Catalogue

Agua Fria Ch., 3 mi. W Manizosa, 1500 ft.

Manizosa Co., Calif. April 7, 1954

144 Sceloporus occidentalis

Bear Ch., 2 mi. S Briceburg, 2500 ft., Manizosa

Co., Calif. April 7, 1954

145 Rana boylei

El Capitan meadow, 3950 ft., Yosemite Valley

Manizosa Co., Calif. April 8, 1954

146 Hyla regilla adult ♂♂

147 " " " "

148 " " " "

149 " " " "

150 " " " "

151 " " " "

152 " " " "

Strenuous meadow, 4000 ft., Yosemite Valley,

Manizosa Co., Calif. April 8, 1954

153 Hyla regilla adult ♂♂

154 " "

155 " "

156 " "

157 " "

158 Bufo boreas holophilus ♂♂

159 " " " "

160 " " " "

161 " " " "

162 " " " "

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Catalogue

67

miles Cr. , 10 mi. NE Placerita , about 700 ft.

Mariposa Co. , Calif. April 9, 1954

163 Rana catesbeiana tadpole.

1/5 mi. S. Sout. Center, 4000 ft. , Yosemite Valley,

Mariposa Co. , Calif. April 24, 1954

164 Hyla regilla ♂

165 " " "

166 " " "

167 " " "

168 " " "

169 " " "

N base ^{Cathedral} Sentinel Rocks, 4100 ft. , Yosemite Valley,

Mariposa Co. , Calif. April 25, 1954

170 Hyla regilla ♀

171 Ensatina eschscholtzii platensis

Same locality as above. May 1, 1954

172 Ensatina eschscholtzii platensis } on display back of Yosemite

173 " " " } museum May 1st.

Stoneman mdr. , 4000 ft. , Yosemite Valley, Mariposa

Co. , Calif. April 30, 1954

174 Hyla regilla

175 " "

176 " "

~~176a " " tad. coll. May 15, 1954~~

Vicinity Rockville, Solano Co. , Calif. May 2, 1954

177 Cantua tenuis (donated to mvz)

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1954

Catalogue

May 13 Pathole meadows, 7750 ft., Yosemite Natl. Park,
Mariposa Co., Calif. May 13, 1954

178 Hyla regilla ♂

179 " " ♂

180 Rana boylei sierrae ♀ adult

Peregon meadow, 7300 ft., Yosemite Natl. Park, Mariposa
Co., Calif. May 13, 1954

181 Bufo canorus adult ♂

Coleur meadow, 4500 ft., 3 1/2 mi. E by SE of
Auberry, Fresno Co., Calif. May 26, 1954

182 Rana catesbeiana

183 " "

also 183a, 183b

0.2 mi. N of Shaver Lake, 5271 ft., Fresno
Co., Calif. May 26, 1954

184 Triturus elegans

185a Ensatina e. platensis
(juvenile)

185 " " "

Kaiser Peak meadows, 8000 ft., 2 1/2 mi. NW of

Kaiser Pass Summit, Fresno Co., Calif. May 26, 1954

186 Bufo canorus adult ♀

187 " " " "

188 Bufo canorus eggs (from above animals)

189 Hyla regilla

190 " "

191 " "

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Catalogue

Kaiser Peak meadows, 8000 ft., 2½ mi. NW Kaiser

Pass Summit, Fresno Co., Calif. May 27, 1954

192 Bufo canorus juvenile

193 " " "

194 Rana boylei senior

→ 0.2 mi. NW of Kaiser Pass Summit, 9200 ft., Fresno
Co., Calif. May 27, 1954

195 Hyla regilla

196 " "

197 " "

198 " "

199 " "

200 " "

201 " "

202 " "

203 " "

204 " "

205 " "

206 " "

207 Bufo canorus

207a " "

208 " "

209 " "

210 " "

211 " "

212 " "

213 " "

214 " "

215 " "

adult ♀
eggs from above laid in jar.

" "

" →

" "

" "

" "

" "

" "

" "

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1954

Catalogue

0.2 mi. NW Kaiser Pass Summit, 9200 ft., Fresno
Co., Calif. May 27, 1954

216 Bufo canorus adult ♂

~~217 " "~~

218 " " juvenile

219 " " "

220 Rana boylei sierrae

221 " " "

2½ mi. E Crane Flat on Hwy 120, 6800 ft., Yos.
Natl. Park, Mariposa Co., Calif. May 29, 1954

222 Rana boylei sierrae

223 " " "

Crocker Station, 3½ mi. E Harden Flats on Hwy.

120, 4450 ft., Tuolumne Co., Calif. June 2, 1954

224 Gerrhonotus coeruleus ♀ (embryos preserved June 3rd)

225 " " ♂ (testes preserved " ")
ELK

~~226 Eumeces gilberti (specimen lost Yosemite Museum)~~
ELK.

~~227 Chamaea bottae (lost while displayed Yosemite Museum)~~

Stoneman meadow, 4000 ft., Yosemite Valley, Mariposa
Co., Calif. June 3, 1954

228 Bufo boreas adult ♀
228a " " series of tadpoles collected April 24 - June 3, 1954.
229 " " " "

230 " " " ♂

231 " " " " collected June 19, 1954

Gaylor Lakes Trail, 75 yards W of Tioga Pass

Ranger Station, 9480 ft., Tuolumne Co., Calif.

232 Bufo canorus ♀ (collected G.R. Eichsm) June 18, 1954

232a " " "
233 " " juvenile



E. L. Kohlstein
1954

Catalogue

100 yards E Tioga Pass Ranger Station, 9920 ft.

Yosemite Natl. Park, Tuolumne Co., Calif. June 18, 1954

234 Rana boylei sierrae

235 Bufo canorus ♀

235a

" " "
" 2 miles E Tuolumne meadows, Yosemite National

Park, Tuolumne Co., Calif. June 18, 1954

236 Bufo canorus ♀

200 yards NE Tioga Pass Ranger Station, 9900 ft.
mono

Co., Calif. June 19, 1954

237 Bufo canorus ♀ (in anaxetus)
237a " " (eggs) - ~~translucent~~ translucent

✓ 238 " " adult ♂ (used for breeding controls)

239 " " " "

240 " " " "

241 " " " "

242 " " " "

243 " " " "

244 " " " "

245 " " " "

246 " " " "

247 " " " "

248 " " " "

249 " " " "

250 " " " "

251 " " " "

252 " " " "

253 " " " ?

254 " " " "

255 " " " "

Catalogue

256 Bufo conous adult →

258 " "

259 41 11

~~261~~ " " " " " "

262 Hylo regilla

263 " "

264 " "

Mangroza Co., Calif. June 23, 1954

265 Bufo boreas

266 " "

Colg. 4050 ft. June 30, 1954

267 Bufo boreas ♀

2,000 ft.

Yosemite Valley (near residential area NW of
Government Center) Marysville Co., Calif May 1954.

268 Bufo boreas

(collected by local boys and

269 " "

put in museum display cases)

Campground 14, Yosemite Valley, 4050 ft.

Moupinia Co., Calif. July 1, 1954

270 Bulb break

Grvt. center Gauge and slope area, 4000 ft.

Yosemite Valley, Mariposa Co., Calif July 2, 1954

271 Bufo boreas ♂

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1954

Catalogue

Campground 19, 4000 ft., Yosemite Valley, Mariposa

Co., Calif. July 7, 1954.

- 272 Bufo boreas holophyllus (collected by David ^{Hartshel}~~Hartshel~~)
273 " " "
274 " " "
275 " " "
276 " " "
277 " " "
~~278 " " "~~

200 yards NE Tioga Pass Ranger Station, 9900 ft

mono Co., Calif. June 19, 1954

- 278 Bufo canorus eggs (from ELK #237)
279 " " " and larvae

Eratic Dome, 1 1/2 miles N-NW of Tiolumne

mdws. Campground, 8600 ft., Tiolumne Co.

Calif. July 10, 1954

- 280 Thamnophis e. elegans

- 281 Rana b. sierrae

200 yards NE of Tioga Pass Ranger Station, 9900

ft., mono Co., Calif. July 10, 1954

- 282 Bufo canorus adult ♀

- 283 " " " "

- 284 " " " "

- 285 " " adult ♂

- 286 " " " "

- 287 " " " "

- 288 " " " "

Photographed with ♂ 7/13
52 mm. body length

E.L. Karlstrom
1954

Catalogue

200 yards NE of Tioga Pass Ranger Station, 9900 ft.

Mono Co., Calif. July 10, 1954

289 Bufo cervinus juvencol

290 " " "

291 Hyla regilla

292 " "

293 Rana boylei senecol

294 " " "

295 " " "

Same locality July 11, 1954

296 Bufo cervinus tadpoles } Different pools.

297 " " "

298 " " juvencol

299 " " "

300 " " "

301 " " "

302 " " "

303 " " "

304 " " "

305 " " "

306 " " "

307 " " "

308 " " "

309 " " "

310 " " subadult (?) ♂

311 " " small adult ♀

312 " "

313 " "

E.L. Karlstrom
1954

Catalogue

200 yards NE Tioga Pass Ranger Station, 9900 ft.

Mono Co., Calif. July 11, 1954

- 314 Bufo coronatus
315 " "
316 " "
317 " "
318 Hyla regilla
319 " "
320 Rana boylei sierrae
321 " " "
322 " " "
323 " " "

Camp 19, 4000 ft., Yosemite Valley, Mariposa

Co., Calif. July 16, 1954

- 324 Gerrhonotus coeruleus palmeri (collected by ^{Marilyn Karlstrom})
July 17, 1954

- 325 Gerrhonotus coeruleus palmeri (coll. David Hortedfelt)
July 18, 1954

- 326 Bufo boreas holochilus (coll. by M.J. Karlstrom)
326a " " " collected E.L. Karlstrom
326b " 100 yards NE "Tioga Pass Ranger Station, 9920 ft.

Mono Co., Calif. August 2, 1954

- 327 Rana boylei sierrae
328 " " "
329 " " "
330 " " "
331 Hyla regilla
332 " "
333 " "

E.L. Karlstrom
1954

Catalogue

200 yards NE of Tioga Bass Ranger Station, 9900 ft.

Mono Co., Calif. August 2, 1954

334	<u>Bufo</u>	<u>conorus</u>	tadpoles & emerged young
335	"	"	juvenile
336	"	"	"
337	"	"	"
338	"	"	"
339	"	"	"
340	"	"	"
341	"	"	"
342	"	"	"
343	"	"	"
344a	"	"	"
344b	"	"	"
345a	"	"	"
345b	"	"	"
346	"	"	"
347	"	"	"
348	"	"	adult
349	"	"	"
350	"	"	"
351	"	"	"
352	"	"	"
353	"	"	"
354	"	"	"
355	"	"	"

Dieter
Swamp Lake, 8400 ft, on Hwy 120, 9 miles NE
of Gin Flat, Tuolumne Co., Calif. Aug. 2, 1954

356 Thamnophis elegans elegans

Stoneman mtn., 4000 ft., Yosemite Valley, Marysca
Co., Calif. May 1954.

357 Bufo boreas holochilus (Raised from toads collected
May 1954 and killed Aug. 8, 1954).

W of Govt. Center, 4000 ft., Yosemite Valley, Marysca
Co., Calif. August 17, 1954

358 Aëronautas melanoleucus (wh-throated swift) sick
study skin
on road. Deposited Yosemite Museum 8/18/54

250 yards E Tioga Pass Ranger Station, 9930 ft.
Mono Co., Calif. August 30, 1954

359 Bufo boreas adult ♀♀

360 " " " "

361 " " " "

362 " " " ♂

363 " " " "

364 " " " "

365 " " " "

366 " " " "

200 yards NE Tioga Pass Ranger Station, 9920 ft.

mono Co., Calif. Aug. 30, 1954

367 Bufo boreas adult ♂

368 " " " "

369 " " " ♀♀

369a " " " "

370 " " juvenile

~~371 " " "~~

372 " " "

373 " " "

374 " " "

ELKarlstrom
1954

Catalogue

200 yards NE Tioga Pass Ranger Station, 9920 ft.
mono Co., Calif. Aug. 30, 1954

375 B. coronus juv ad

375a

376 " " recently metamorphosed (9)

377 Hyla regilla

378 " "

379 " "

~~380 Rana boylei sierrae adult~~

N end Tioga Lake, 9500 ft., mono Co., Calif.

381 Bufo coronus ♂ (collected by Aug. 28, 1954

382 Hyla regilla Ranger Doug Rafferty)

Residents' vegetable garden, Yosemite Valley, 4000 ft.

Mariposa Co., Calif. Aug. 31, 1954

383 Bufo boreas holophilus adult ♂ (collected by one
of local boys and brought to ^{Yosemite} museum)

~~38~~ Road to Mormon Bar, SE of Mariposa, Mariposa
Co., Calif. July 1954

384 Bufo boreas holophilus ♀♀ (collected by young girl
near culvert along road. Others reported)

Govt. Residence area, Yosemite Valley, 4000 ft.

Mariposa Co., Calif. July 1954

~~385 Gerrhonotus coeruleus palmeri (collected by local boy
and brought to Yosemite museum) Returned to collector.~~

1.3 mi. N., 0.2 mi. W. Civic Center, Richmond
California (Contra Costa Co.) October 10, 1954

385 Taricha torosa (juvenile)

386

" " "

387

" " "

EL Kodstrom
1954

Catalogue

Front of Rogers' Club, Govt. Center, Yosemite Valley
4000 ft., Mariposa Co., Calif. Oct. 16, 1954

388 Bufo boreas holophilus subadult

389 " " " adult (coll. by R. Russell)

Stoneman meadow, 4000 ft., Yosemite Valley, Mariposa
Co., Calif. Oct. 16, 1954

390 Bufo boreas holophilus adult ♀♀ (coll. by R. Russell)

3 mi. W Clearlake Park, 1400 ft., Lake Co.,
Calif. Oct. 17, 1954

391 ♂ Agelaius phoeniceus (coll. by Alden Miller) 66.6 gm.

~~3920~~ " " decomposed + discarded 24.6 gm.

End 1954 entries

Ernest L. Karlstrom

1954

Journal

E.L. Karlstrom
1954

Journal

April 7 Chuckie, Kris, and I left MU2 8:15 A.M.

Speedometer reading 28044.0. Took Highway 24 to Walnut Creek, U.S. 50 to Tracy arriving there at 10:15 A.M. Slow progress due to new set of rings in Plymouth suburban. Merced 12:00 noon, (174.0) Weather warm and sunny, in middle 70's with moderate breeze. Slight patches of billowy clouds in foothill regions. First collection stop made 1:15 P.M.

3 miles W Mariposa^{1500 ft.}, Mariposa Co., Calif
Aqua Fria Creek here runs along south side of State Hwy. 140. We stopped by a roadside stand - State Hill Wayside Stand. Wide pools of slow moving water at this point. Creek is fairly low now, at most a foot in depth. J. E. Thomas, owner of Wayside Stand an old-timer in this area. He reported that Aqua Fria Creek dried up about last of July 1953, although springs fed it for a while. Completely dry creek bed by August. Conditions today seemed right for adult Rana or onion eggs in stream or spring pools but I saw no signs of any amphibians. Mr. Thomas gave a clue. The creek had 4-5 feet of water about one week ago. He has heard frogs (Rana presumably) calling since last week in March when he set up stand. I collected one small Sceloporus under a piece of rotted

E.L. Karlstrom
1954

Journal (2)

April 7 log. The stream temp. at 1:30 P.M. 19° C. Air temp. (shaded bulb) same.

2500 ft.

Bear Creek, 2 mi. S Briceburg, Mariposa Co., Calif.
2:50 P.M. Road repairs on Briceburg grade stopped us here until 4:30 when caravan of cars piloted through. The stream parallels the highway here. Ravine is steep-sided and fairly well strewed with rock and earth from work on road. Temperatures in the high 60's warm and sunny. One Rana boylei was taken in shallow water. The left front tire had picked up a sharp stone and I had a half flat tire which I changed while we waited for the 4:30 caravan. A pilot car led us down the Briceburg Grade to Briceburg itself where Hwy. 140 was clear right into the Valley. Arrived Yosemite Lodge 6:05 P.M. (speedometer 28246.) Road miles Tracy - Montecito - Modesto - Merced - Mariposa - Valley about 202 miles. I called Doug Hubbard at his home (#24 Employee's residence area northwest of Govt. Center) and he suggested we save money by using Ranger's Club instead of Yosemite Lodge cabins. We elected, however, to camp out at Camp 4 instead. Kris bedded down in play pen back^{part} of station wagon. We slept on air mattresses beside the car. Big Ursus americanus scared hell out of my wife about one o'clock. The

E. L. Karlstrom
1954

Journal (3)

April 8 old man should have hung metal food locker up in trees instead of just fastening the hose. The night was clear and cold ($35-40^{\circ}$ F.). Kris woke us 6:15 A.M. Temperature at 7:15 was 6° C., and the sky overcast until close to 8 o'clock. I met Hubbard and other resident naturalists at the museum in morning and was shown through the working areas of the museum. At 10:45 A.M. it was clear and mild in the low 60's. We drove to El Capitan meadow and checked large pond near the road. Hyla adults were calling and egg clusters, some small toads taken from pond. A bobcat was sighted near the pond when we first arrived. After lunch at the Yosemite Lodge Cafeteria we went to Stoneman meadow. A large patch of snow adjacent to the meadow gave an indication that it is colder here. The northwest exposure with sheer cliffs of Glacier Point may account for the later snow melt here. Otherwise, the meadow in some condition as that at El Capitan. The dead brown grass lies fallen, and little green grass is now evident. Air temperature 21° C. at 1:50 P.M. Strong NE wind. More Hyla calling here. Eggs and small toads again taken. At 3:30 we checked area SW of Old Village. The

E.L. Karlstrom
1954

Journal (4)

April 8 locality suggested by Stebbins lacks sufficient running or standing water to yield any good breeding sites. The creek bed coming from Glacier Sentinel Rock is dry. The only pond I found big enough to hold Hyla was at the base of a large boulder on the south side of the church at Old Village. A few adult Hyla were visible in the water and egg clusters were present. I took the trail leading along the base of the Valley wall SW from Old Village. No large pools were visible. It appears as if the meadow area SW of Old Village is out as a study site. However, ponds along the SE side of the road between Sentinel Bridge and Camp 6 may be a possibility. These pools follow a course along the road and apparently represent flood courses of the Merced River when it is high. Certain of the pools are boggy. Water samples were taken at pools where Hyla were heard (eggs present) and in brownish pools where there were no signs of anurans. It remained clear but cool in the early evening as we returned to a cabin rented earlier in the day near Yosemite Lodge. at 8:00 P.M. I collected my night collecting gear and headed back to El Capitan meadow. air temp. 70 C. Raucous Hyla chorus here. moon $\frac{1}{3}$ full gave light to open meadow pond here.

E.L. Karlstrom
1954

Journal (5)

April 8 At 8:35 P.M. I checked pools SE side of road between Sentinel Bridge and Camp 6. Water sample taken (speedometer reading 9.55) and then SW down road (9.6). Sentinel Bridge reading 9.7. Hyla heard only at 9.6 spot. At 9:05 P.M. I arrived at Stoneman meadow ^(4000 ft.). Loud Hyla chorus from various rivulets and ponds middle part of meadow. Evening remained clear and cold. Air temp. 2.5°C . at 9:30 P.M. I collected 5 adult male Bufo boreas at one pond south side of road. Returned half frozen to cabin 10:10 P.M.

April 9 Morning broke clear and cold. Temp. near cabin 7:30 A.M. was 8°C . I checked in at the museum 8:30 and constructed a box for the max.-min. thermometer in the museum store. Norm Herkenheim gave me an assist in finding materials. at 9:30 I checked ponds located in meadow area between Camp 6, Government Center, and Sentinel Bridge. Hyla adults calling and some out in water. Temp. now high 50's with moderate to strong westerly wind. Ponds near where road blocked off ($\frac{1}{2}$ mile SW Government Center) may prove to be ideal study site. Herkenheim reports that ^{foot} traffic in summer should be slight. The ponds are on low ground. Any pathways would be higher or people would tend to stay on old roadway. This site would be between Camp 19 where we will live in summer and museum where I will work.

E. L. Karlstrom
1954

Journal (6)

April 9 After picking up repaired tire (boot had been required) and loading the wagon, we drove to the museum at 11:00 A.M. I talked with Homer Hoyt (see notes), weather records man, at the Adm. Bldg. and then picked up Norm Herkenheim. We drove to Stoneman meadow, set up covered thermometer, and secured it with stakes. I took notes until 12:30 P.M. at Pond A and also habitat pictures (see under B. brevis). We drove fast to Briceburg for the 1:30 + outgoing caravan, arriving 1:25. Our car was 3rd from last and we were parked not more than 1/2 mile from Gorman's Hydromantes brunus locality (0.7 mi. N of Briceburg). It was slow first and second gear driving, start and stop, to top of the grade. Suggest earlier arrival if this caravan taken out of Valley. The dust was heavy and on a hot day your car would boil over in a hurry. Local estimates for completion of the major part of road construction were 2 months from now. Later: Oak Flat Road may be better way out of Valley. Speedometer readings coming home: Valley (Lodge) 28301 where I got 5 gallons gas. We hit Placoda on Hwy. 140 at 3:23 (8371.1). Tracy (28450.0) 5 gallons gas and eat stop. Berkeley 28505. ^(adult seen)
Rana catesbeiana tadpole taken miles Creek, 10 miles NE Placoda, Mariposa Co., Calif. Elevation about 700 ft.
Time 3:10 P.M.

E.L. Karlstrom
1954

Journal (?)

April 9 Doug Hubbard, Associate Naturalist at Yosemite, reports that Tioga Pass Road slated to be open by June 15, as is customary. A naturalist is usually at Glacier by end of June when public can get to Glacier Point. He directed me to Homer Hoyt, a Ranger now available at the Administration Building, who now operates weather station at museum and has kept Yosemite records for years. Hoyt let me see weather data sheets for past year. Some pertinent figures are here listed (readings taken daily at 5 P.M.):

Date	Temperature of		Snow depth at museum
	Max.	min.	
March 17	Freezing or		18"
20	below min.		9
23	temps. taken		5
24			9
28			patches
31	high for Feb. 69°		—
April 1	64 - 32		—
2	68 - 29		—
3	70 - 34		—
4	69 - 40		—
5	57 - 42		0.17 inches ppt.
6	60 - 40		0.22 " "
7	68 - 34		—
8	68 - 34		—
9	- 34		—

E.L. Karlstrom
1954

Journal (8)

April 9 Ranger Hoyt also provided some comparative data on snow depths 1953 vs. 1954. The season is later this year, closer to normal, than the dry winter of 1952-1953. The snow was virtually gone from the Valley floor toward the end of February 1953. This spring it took until the end of March. Today at Bodger Pass snow depth is 74 inches, whereas in April 9, 1953 34 inches covered the ground. Hoyt stated that it now would be possible to drive to a point near Peregon meadows (about 7200 feet) on snow-plowed ^{road leading to} Ostrander Lake ski trail. With permission from the Superintendent it would also be possible to now get up to Crane ^(6000') Flat on Big Oak Flat Road. By mid-May it should be possible to get to Gin Flat (7000 ft.) I neglected to ask about the older, poorer Oak Flat Road to Tamarack Flat (6500 ft.) If warm spring weather continues it will be wise to check these low canon localities as early in May as possible.

E.L. Karlstrom
1954

Journal (9)

April 24 R. Stebbins and I left Berkeley 4:25 A.M. in the MVZ truck. From Stebbins' home we took the Inspiration Point road through Tilden and finally cut into State Hwy 24 near Orinda. morning cool and slightly foggy Berkeley area. Valley overcast and cool, in the low 60's. Modesto 6:05 A.M. merged a little after 7 A.M. Canyon system over construction route Buiceburg grade not operative weekdays. We stopped 8:45 A.M. at the E side of the bridge at Buiceburg. A search down NE facing slope of the Merced canyon turned up one ring-necked snake by Stebbins. Too dry for Hydromantes here although the rocky outcrops seemed ideal for their habitat. Also deeper looser soil available here than at drinking fountain locality up Hwy 108 0.7 mi. from Buiceburg. Later in the morning we checked the El Capitan meadow site. Hyla calling. Water level up. We checked in at Yosemite museum before noon. Weather overcast good part of morning, unsettled.

Following notes mostly gleaned from R. Stebbins' species accounts since I spent most of trip fiddling with thermal apparatus.

Arrived Pavilion meadow, 7300 ft, Yosemite Natl Park Mariposa Co., Calif about 1:00 P.M. meadow mostly covered with snow but in bare patches first plants (strawberry & others) are just poking up.

E.L. Karstun
1954

Journal (10)

April 24 Peregoy mdr., 7300 ft., Yosemite Natl. Park, ~~Mariposa~~
Co., Calif. These plants could not have been out
more than a few days(?) area in full sun
except under lodgepole pine cover. Willows
along stream budding but none burst. We drove
through clouds from near Wawona Tunnel to
Chinquapin and thence thru mist nearly to
Peregoy. Scattered low clouds seen from Peregoy
but sun shining most of time. Clouds drifting
through tree tops. Clouds obscured sun
continuously beginning about 2:35 P.M.

Stoneman meadow, 4000 ft., Yosemite Valley at
4:50 P.M. (D.S.T.) Sky overcast. Apple trees
with new leaves and in full bloom. Black
oak reddish brown leaves and catkins - just
coming out; some not out. Black cottonwood yellow
green leaves, just out. We made night checks
of Stoneman ~~and~~, Govt. Center meadows, and one
SW of Old Village. Only good take seen were
at Stoneman. Hyla chorusing all places checked.

April 25 Phenologically the Valley appears to be about $1\frac{1}{2}$
months ahead of Peregoy meadow area (K.C.S.) So Peregoy
looks much like Valley did in late February this
year(?) We worked at Govt. Center site after
4:30 A.M. (D.S.T.) Busty light breeze, scattered
clouds. Temp in 60's. Stebbins took Hydromantes below
Cathedral Rocks about 2 P.M. I got an Ensatina. Left
Valley 4:30, arrived Berkeley 9:45 P.M.



E.L. Karlstrom
1954

Journal (11)

April 30
~~May~~

John Erickson and I left Berkeley 5:45 A.M. (D.S.T.)
Weather clear and cool. Walnut Creek, Danville,
Modesto 7:15 A.M. Merced 8:10 A.M. Original
speedometer reading Berkeley 65102. Valley clear and
cool, in 60's. We hit the Bear Creek construction
zone at 9:10 A.M. (D.S.T.) Scattered clouds, cool.
Bear Creek, Agua Fria Creek clear but not exceptionally
high. Radio report this morning reported that Elberta
and Lower Posse ^{roads} would be clear to about 7000
ft. Trout season opens tomorrow. The Merced and other
sierran streams are reported high, muddy after rains
and snow melt of past week. We arrived at the
Valley 11:00 A.M. (D.S.T.), got the key from
Doug Hubbard at the museum for the chain
blocking the Elvies Point Road, and proceeded
to Perego Meadow. Intermittent sunshine, clouds,
and scattered drops of rain in the Valley. More
of the same only snow flakes instead of rain
at Perego. I estimate 4-5 inches of new snow
at that meadow. Weather cold, about 40°. Took
trux. data and set up thermograph (air) at
Perego, freezing in the process. Return to Valley
4:30 P.M., groceries at Old Village (well-stocked
place!) and set up stove for grub camp 4
in the early evening. Windy, overcast weather, some
raindrops fell.

Night checks Stewart mdw. 8:30 P.M. (D.S.T.)
and $\frac{1}{5}$ mi. S Gant. Center. Weather remained

E. L. Karlstrom
1954

Journal (12)

April 30 Govt. Center, Yosemite Valley, Mariposa Co., Calif

checked april weather station records from museum

april 27 ^{max. min} 58-44° F. at obs. 5.00 P.M. 42° ppt. .81

28 57-32 51 .89

29 62-35 45 .14

30 50-37 45 .04

It rained most of night Tuesday (April 27).
Rain and elevated temps. that night apparently
failed to initiate breeding again, at Stoneman
or Govt. Center site, at least. It may take a series
of warm nights to get the animals out (?). Weather
overcast and cool, slight breeze. Increased number
of ponds and rivulets all meadows resulting
from week's rains (see above). Erickson and I
earlier (7:45-8:15 P.M.) took in movie shown
by Doug Hubbard at Yosemite Lodge. Spectacular
color movies of volcanic eruptions Hawaii, film
under auspices Hawaiian Natl. Park. Lodging
at Ranger's Club.

May 1 Yosemite Valley. Day broke clear and cool. after
breakfast at Old Village I commenced check of thermal
equipment at Govt. Center site. Water level in ponds
up about one inch (see B. Brown account.) moderate
breeze, the air temp in 60's rear room. Deciduous
trees well leafed out although oaks lag behind
cottonwoods. Clear weather continued until about 3 P.M.
(D.S.T) when clouds formed western end of Valley.
Intermittent sunshine from 4 P.M. on until we left

E.L. Karlstrom
1954

Journal (13)

May 1 Valley View, about 3900 ft. Yosemite Valley, Mariposa Co. Calif. Left Valley via Big Oak Flat Road. Speedometer 421.0, 4:45 P.M. (D.S.T.) no snow on road all the way out of Park. At Crane Flat (El. ft.) snow about a foot deep in meadow near Ranger Station, patchy, run off streams already forming. It would be wise to check this possible low altitude canon locality as soon as possible. Winding road Hwy. 120 for about 40 miles from Crane Flat but surface in good shape. Road straightens out west of Chinese Camp. Gas stop Oatdale about 8:00 P.M. (D.S.T.) Arrive Berkeley 9:45 P.M. Speedometer 607.6. Mileage from Govt. Center, Yosemite Valley, to Berkeley about 187 miles.

E. L. Karlstrom
1951

Journal (14)

May 13 I left Berkeley ^{5:50 A.M. (D.S.T.)} travelling alone in the Plymouth. Initial speedometer reading 28686.6. Gas filled 15.0 gals. regular, total \$4.41. Weather clear and cool Bay area, mostly cool and fair Valley. Reached 8:30 A.M. Yosemite Valley (Cant. Center) at 11:00 A.M., speedometer 28896.2. Apparently no carover at Bruceburg Grade today. Road repairs there are at scraping stage preparatory to oiling. Valley clear, cloudless sky, and warm - in high 70's about noon. I unloaded some gear at the museum, storing boxes of equipment in large basement room. Worthen Bill at the Administration Bldg. briefed me on Valley mosquito control (see B. brevis species notes). The Sanitation Engineer is on leave for a few days, so I couldn't see him.

Stevenson Meadow, 4000 ft., Yosemite Valley. 12:15 P.M. (D.S.T.) weather warm and clear. Steady NW breeze strong enough to ripple the ponds. Checked oiled pools here. Samples of Bufa and Hydra taken. I left Stevenson about 2 P.M. and headed up to Peregoy Meadow. Weather same but some billowy low clouds. Snow completely off most of Peregoy meadow. Some patches (to 1½' deep) higher ground under shade of pines. Left Peregoy for Glacier Point, arriving there 6:05 P.M. Road clear of all snow. Evening clouding over but weather still mild. Check meadows between Glacier Point and Peregoy. Left Glacier Point 6:48 P.M.; mileage reading 32.6. First stop

E. L. Karlstrom
1954

Journal (15)

May 13 Pathole meadows, 7750 ft., Yosemite Natl. Park,
Mariposa Co., Calif. (mileage 35.5) made check
here 7:30 P.M. (D.S.T.) Sky slightly cloudy, temp.
mild. Hyla chousing. checked Peregrin meadow
8:45 - 9:45 P.M. some evening. $\frac{1}{2}^+$ phase moon
cast soft glow over open meadow. Air temp.
cool, in high 30's F. checked Gort. Center meadow
10:20 P.M. Two adult σ took marked and released.
Through check of woods and ponds. Then a check of
Storacean meadow. One f adult marked & released. Temperature
considerably warmer than Peregrin meadow, as would be
expected.

Talked with Doug Hubbard. For a
King's Canyon - Sequoia Natl. Park collecting permit write
Eivind T. Scogen c/o 3 Rivers.

Robert Rose - Park Naturalist will issue it. mention
talk with Hubbard.

May 14 Gas 7:40 A.M. Yosemite Lodge 15.5 gallons, mileage
966.8, \$5.00 even. Breakfast at Old Village, then
check of Gort. Center locality. Conversation with Doug
Hubbard before leaving. Oiling done in liquid form, no
spraying. He doesn't know when other meadows will be
oiled.

Leave Yosemite 11:35 A.M. mileage at Lodge 970.0.
First stop on Big Oak Flat Road 985.4. meadow here
just before Crane Flat (86.1) Ranger Station. Scattered
clouds but sunny. Rana boylei several eggs and

E. L. Karlstrom
1954

Journal (16)

- May 14 $\frac{1}{2}$ mi. SE of Crane Flat Ranger Station, 6700 ft.,
Yosemite Natl. Park, Tuolumne Co., Calif. one adult
seen at above locality. Rana egg clusters collected.
no signs of B. conours here yet, but promising breeding
site (?) afternoon overcast and very windy in the
valley. Arrived Berkeley 6:00 P.M. (D.S.) mileage
1160. Road mileage from Yosemite Valley to Berkeley
via State Hwy 120 to Manteca, U.S. 50 to Walnut
Creek road 190 miles. Winding road from Crane Flat
to Chinese Camp makes this route much harder to
drive and slightly longer driving time.
- May 21 Left Berkeley in Plymouth with John Erickson and Ann
Tucker 4:30 P.M. (D.S.) ^(speedometer 29483) miserable traffic to Walnut
Creek and south to U.S. 50. Arrived Yosemite Valley
about 10:45 P.M. ⁽²⁹²⁷³⁾ Evening fair and mild. Checked
- May 22 Govt. Center station 11:05 A.M. sunny skies, temp.
high 70's. Recorded max-min. temperatures and
charged charts on thermographs. Afternoon spent with
young adult groups from St. Michael's church, Berkeley.
Evening fireball watched from Govt. Center meadow.
Gee 1541 ^{golden (29738.)}
Two adult B. boreas picked up in broken area.
- May 23 Clear, stormy evening, mild. Trip to Glacier Point
next morning 10:00 A.M. (D.S.) On return trip I
stopped off at Peregoy meadow 2:00 P.M. and
checked weather station. Air thermograph was
running but had not for nearly all of week.
This thermograph apparently had been wound too

E. L. Karlstrom
1954

Journal (17)

May 23 Peregon meadow, 7300 ft., Yosemite Natl. Park, Mariposa Co., Calif

tightly by Stebbins two weeks ago. Hopefully it will resume normal operation if spring gets close to unwind some. Warm sunny afternoon with moderate breeze. Sam Clarke, Ranger at Chiquozin, stopped by while I was at the meadow. He suggested getting my car completely off the road since Sunday traffic heavy and cars tend to speed up on the straight-away here. Clarke mentioned meadow in front of lodge at Bodger Pass, much water and he thinks he saw a toad ^(Hyla?) from there. I returned to Valley about 3:30 P.M. Assembled gear Tent 4 Camp 19. Return to meadows along Glacier Point road 8 P.M. Temp. low 50's, clear night at Pothole meadow, 1700 ft, Y.N.P., Mariposa Co., Calif. 9:10 P.M. (D.S.) Hyla calling. adult ♀ Rana. Cloacal temp. 13.5°C, water 14.0°C., air 10.2°C. 9:20 P.M. I checked water temp. in running rivulet, 9.1°C. 3 other adult frogs seen. no craus (above temp. data under Rana boylei species account, too). I returned to Court. Center meadow 11:00 P.M. after making a hurried check of Peregon meadow. no craus calling latter. Found 3 adult bores at Court. Center site. Night clear and cool. Air temp. 12.5°C. at 11:05 P.M.

May 24 Yosemite Valley. Day spent setting up tent and equipment Camp 19 and research space at museum. Made

E. L. Karlstrom
1954

Journal (18)

May 24th evening check of Stoneman mdr, Yos. Valley 7:30 P.M.
Air temp. 14°C. at 7:45 P.M. Clear, coolish evening.

May 25 check of Gout Center locality made at noon. See
Bufo boreas species account for phenological data.

Clear sunny skies, moderate westerly breeze. A quick
lunch at Camp 19 before heading southward.

Left Camp 19 3:00 P.M. (D.S.), mileage reading
296⁸⁷~~88~~.0. Temp in 70's, clear but blustery winds.
Peregrine mdr. 3:40 P.M., mileage 709.8. I set up
thermograph in upper meadow for water temps. On
way back toward Chiquapin Ranger Station I checked
a good-looking canon meadow. mileage 711.6. Hyla
chrousing loudly. meadow runs SW x NE, 150 yards
long 50-60 yards wide. Rana boylei egg clusters
in small stream. Large shallow pond 50' diameter,
1½' deep middle in center of meadow. Here Hyla
chrousing. 5:05 P.M. Drow patches under lodgepole
pine S edge of meadow to 2½' depth. Varied types
of water breeding situations available. Continued on to
Chiquapin, mileage reading 717.7. Gas 9.8 gallons
regular. Fish Camp on Hwy. 41 south of Park
boundary 39.7. Westfall Ranger Station, Sierra Natl.
Forest 40.3. Don Phillips, Forest Ranger, provided me with
map and directions to Boggy meadows. I headed N
again toward Fish Camp on Hwy 41, then turned
E at mile-^(42.7)14 Cabins. Rough single lane forest service
dirt road. First ~~water~~ meadow at 47.6. ¼ mile
further the road came to an abrupt halt at a level

E. L. Karlstrom
1954

Journal (19)

May 25 4 miles E of Fish Camp, Sierra Natl. Forest,
Monterey Co., Calif.

Camping area alongside a creek. The road headed across the creek but it was too deep to drive across. At 7 P.M. I decided to stop here and fish for my dinner. Two young 5-6" rainbows (dull markings) were taken. Royal Coachman fly most effective. Other trout which rose were some size or smaller. 8:30 P.M. (D.S.) I decided to scout for other road to Boggy meadow. I started back the same way I came but found no other roads which had tire tracks. The roadbed is so bad 10 m.p.h. is top speed. Winter wash has not been removed. The maze of forest service "roads" here is beyond me without a jeep. No Hyla or other anurans were heard in this back country. Level areas are few as the canyon walls are steep-sided. Elevation about 6000 ft. Logged off rocky country with yellow & sugar pine, incense cedar, much manzanita. At 9:15 P.M. I was back out to Hwy. 41. Traveled S to west side of Bass Lake where I camped at Sierra Natl. Forest public camp. Hyla calling.

May 26 Breakfast beside beautiful calm Bass Lake. Warm clear morning. Bullock oriole (2), many Brewster's blackbirds, ^{robins} white-crowned sparrow my visitors. South on Hwy. 41 to North Creek. Talked with Forest Ranger at store there. Kaiser Pass has been open 6 weeks, opened early because of Edison Co. dam going up. Suggested taking new Aubrey grade, left turn

L. Karlstrom
1954

Journal (20)

May 26 at stop sign N edge of Aubrey. Speedometer reading 795.0. Weather clear and hot. Started climbing steadily from Aubrey. Stopped at flat meadow area (speedometer 803.6), probably Corlew meadow. 12:30 P.M. Long meadow semi-open with pine stumps covering it. Slight flow of water thru its $\frac{1}{4}$ mile length but mostly standing seepage pools to $1\frac{1}{2}'$ depth. A few Hyla toads present but only in some of the clearer pools. Adult but small bullfrogs (4) taken. Pasture meadow, many stagnant pools. Most standing water has dried up and ground is dry under most fallen logs and bark except in lowest part of meadow. Cnemidophorus and Sceloporus seen but too active to get close to even with my noose-rigged 9' fly rod. Air temp 2" above ground, bulb shaded, 20.5°C . at 1:50 P.M. (D.S.) Full bright sun, slight breeze. Area predominantly yellow pine but scattered oaks and manzanita. Grasses in meadow to 20" height. Large doses of grayish granite outcrop in area. Alder Springs 804.8
Shaver Lake 813.9.

0.2 mi. N of Shaver Lake, Fresno Co., Calif. Two Thamnophis taken in small 75 x 40 yards pasture meadow. Also a juvenile Ensatina under a small piece of fir (?) rotted bark. Hyla toads in shallow pools just approaching hind leg development stage. Heavier forest canopy here providing moist soil under downed logs and branches. Weather still clear and mild.

E.L. Culbertson
1954

Journal (21)

May 26 Big Creek (825.0). Lake shore at Huntington Lake (834.9). Some patches of snow under trees at Huntington Lake, El. 7000 ft. Continued on to Kaiser Pass Summit (9305 ft.) speedometer 841.4. Road to sample meadow rough but possible, that is, half way. A deadfall halted me at (845.1) and I turned back. Kaiser Peak meadow, El. 8000', $2\frac{1}{2}$ miles NW from Kaiser Pass. Hyla calling here. Sky clear, moderate breeze, temperature 12-13 °C. about 6 P.M. Two adult ♀ B. coronus collected along with eggs. ^{also one adult ♂.} I returned to meadow 0.2 mi. NW Kaiser Pass Summit. It turned cold very fast as the sun set. It was 5 °C. by about 8:30 P.M. night sky clear, no breeze. Attempted to get recordings of coronus calling this locality but only got about 30 seconds of ♂ resisting amplexus advance of another ♂. See Toxer #1. also see B. coronus species accounts for night and morning temperature data.

May 27 0.2 miles NW Kaiser Pass Summit, Fresno Co., Calif Remained here most of day recording coronus calls and gathering minab & temp. data. Clear skies all day, slight breeze. About 3:30 I again went NW down road to Kaiser Peak locality. One coronus ♂ banded, ^{about two} two juveniles collected. ~~Dozens~~ of adult Rana taken for food and scientific purposes. Hyla calling. made camp 7 P.M. Billy Creek Campground on NE shore Huntington Lake. Went back up Kaiser Pass road at 9:30 P.M. to check Bodger Flats, El. 7800', Fresno Co., Calif. E.A. Culbertson of Fresno State had

E.L. Karlstrom
1954

Journal (27)

May 27 Bodger Flats, El. _____ ft., Fresno Co., Calif. suggested I try this as an intermediate altitude between B. bores at Huntington Lake and corvus up at Kaiser Pass. Little meadow area noted here. No Hyla or Bufo calls heard. Cold, clear night. More meadow area may exist here than I had time to find. Returned to my Billy Creek campsite after midnight.

May 28 Left Huntington Lake (Billy Creek Public Camp) at 8:45 A.M. (D.S.) Speedometer (880.) Road noted along Hwy 168 (83.0). Big Creek 9:15 A.M. 10.6 gallons gas, \$3.50. Another meadow SW of Hwy 168 (92.6). Returned to Yosemite via same route taken south. Checked Paragon meadow corvus station about 3:30 P.M. Return Yosemite Valley 4:30 P.M.

E.L. Karlstrom
1954

Journal (23)

May 29 Yosemite Lodge gas station, Yosemite Valley, Calif.
Filled tank (10.1 gallons regular) at 9:00 A.M. \$3.27
Speedometer 024.1. Headed up Big Oak Flat Road
out of Valley. Crane Flat 040.1. Tioga Road, first
stop small meadow SE side of road 042.9. A small
open grassy pocket 80x40 yards with melt off
water running thru it. Shallow pools (to 6" deep).
Last trace of snow on 6x3'x8" patch under forest
margin. Rana eggs. one young frog taken. algal
growth fair in stiller pools. plenty of deadfall
log cover for toads. Crosses to 8", no signs of
conurus. Check at night! Road to Tenorock Flat 42.6.
Road surface generally good with some frost upheaval.
Tenorock Flat 46.2. Small meadow beyond 47.2.
10:15 A.M. (D.S.) Day clear and warm, temp. now in
high 60's. No signs of anurans at all though plenty
of water & cover. This meadow (50 yards wide) adjacent
to Coyote Creek. Coscodo Creek Bridge 48.8. End of
kept-up Old Oak Flat Road 49.7. Steep drop
from Tenorock Flat. Apparently no available meadows here
at lower part of road. I talked with a fisherman
who has been in this area regularly since 1918. Frogs
seen along creek but no toads. He killed rather
down by Coscodo Creek about 1925. meadows are
along Tenorock Creek north of the campground. No
time now to hike up along creek (at least not
without a fishing pole). Back out N to Tioga
Road 056.1. White Wolf meadow, 8400 ft. Speedometer

E.L. Karlstrom
1954

Journal (24)

May 29 White Wolf meadow, 8400 ft, Yosemite Natl. Park, Mojave Co., Calif. reading 067.4. Weather clear but cool strong breeze. Dryas calling. Arrived here 12 noon. Next stop a meadow S side of Tioga Mine Road (070.1) ^(Potholes & seepage pools)
Porcupine Flat, 7950 ft., Y.N.P., Mojave Co., Calif. Speedometer 76.5. Type locality for species. Practically no level ground near public campground. Go E about $\frac{1}{8}$ mile. The gentle S slope toward the creek has runoff flow. Little wood for cover and very little rodent burrowing. Rana adult seen in stream. Snow patchy covering less than $\frac{1}{5}$ of area described above.
Porcupine Creek Campground (79.1), Snow Flat 82.2 level, $\frac{2}{3}$ rd snow covered. I didn't take time to stop at Snow Flat. It looks like good conurus area. Arrived Tuolumne Meadows 3:15 P.M. Loaded my gear on a packboard and hiked about 3 miles up Lyell Fork of the Tuolumne. ~~Brook~~ Brook valley opens up at this point. The river is high. Only small patches of snow remain under the lodgepole pines bordering the valley. Deep-seepage pools numerous as well as rivulets and streams cutting into the main river. Strong wind. Evening clear and cool. I tramped through the meadow area bordering the stream. Only Dryas heard and these very few. Lyell Canyon still overall brown with dead grasses but the new ^{air temp -3°C.} green grass is to 2" tall. 7 A.M. I hiked to Lower Lyell Base Camp and fished 1 mile downstream. Limit

flies effective
mosquitoes
California coachman, mayflies
Brook trout to 8"

Journal (25)

May 30 Tahumne Meadows, 8600 ft., Y.N.P., Tahumne Co., Calif. Evening check here 7:30-8:15 P.M. Lots of water in meadow (see B. canus notes for temps.) no Tioga Pass Ranger Station, 9940 ft., Tahumne Co., Calif. (109.7) Weather clear and near freezing 9 P.M. Made night check with headlamps and also sat in car listening for canus. Dyla only calling. Down precipitous grade to Lee Vining (121.8). Hamburger & coffee Dick's Cafe, then back up Hwy 120 to Lee Vining Public Conge Ground by 10:30 P.M. Canyons from Tioga Pass down east side very steep-sided and doubtful much good habitat afforded except up near crest. Sagebrush and arid upper Sonoran comes in just about Mono Lake Area. Walker Lake at 7926' in Canadian Zone should be checked out

June 1 Sunday, if possible, morning broke clear with high clouds to the east. Temp. at 8 A.M. high 60's. Returned Lee Vining 8:30 A.M. (123.8), bought groceries and headed N up U.S. 395. Rds W side of highway at (125.5). Shallow (to 1" middle) 50x150 yard lake used for watering stock. No signs of eggs or tracks or any mammals. Continued N on U.S. 395. Took side road trying to get to edge Mono Lake but it led away from it. Conway Summit (El. 8138') 10:15 A.M. Stopped for lunch Swager Valley Creek (157.6), N of Bridgeport. Jct. of U.S. 395 and State Hwy 108 (67.5). Lovitt Meadows Lodge 77.3. Owner of lodge says he hasn't seen tracks in "this country" in 15 years he has killed meadows. "He's seen birds, though." Sierra Pass Summit 2:40 P.M.

E.L. Karlstrom
1954

Journal (26)

June 1 Snow Pass, 9624 ft., Tuolumne - Mono county line, Calif.
most of Pass now covered with 2-4 feet of snow. Area 500
down W side where I camped last year is $\frac{2}{3}$ now covered
with 1-2' of snow. Cold, 25-30 mile wind blowing up
canyon from west. Billowy white clouds cover most of sky.
Took Kodachrome #5 looking S from 9000' marker toward
Leavitt Peak. #6 slide taken facing W from up on boulder
above camp site. F 6.3 at $\frac{1}{50}$ th for both, made
search of open willow area for toads. No luck! Then
hiked up creek to a crossing and came down N and W
facing slopes searching for Hydromantes. Plenty of seeps but
no salamanders. at 5 P.M. I went E over Snow
Pass again and checked for crabs in meadows four
miles E of Summit. continued down W side to Kennedy
meadows, 6200 ft. and made camp at Deadman Creek
Campground. No signs of herps at Kennedy mds. except
for a garter snake in a deep pool. Grass to 10-12" here

June 2 Left Deadman Creek Campground 10 A.M. (219.0). Stopped
by road construction on Hwy 108 about 6 miles W of
Dardanelles (231.0). Gas at Long Born (258.0)
16.0 gallons. \$5.25. continued Hwy. 108 past
Jonestown, then cutoff to Chinese Camp and on Hwy. 120.
Crocker Station (sect. 33, Township 119 E) Speedometer
(330.2). Stopped here to check for toads. H.P. Molander
and Monty Wilderkopf at the Station provided me a
most interesting afternoon. They in 15 years have not seen
toads in area, and they seem to recognize various
species as yellow-legged frog & tree toads. I heard

E.L. Karlstrom
1954

Journal (27)

June 2 Crocker Station, $3\frac{1}{2}$ mi. E Under Flats on Hwy. 120, Inyo Co., Calif. 4452 ft.

the history of this old stage coach station built with hotel, stables, cabins in late 1860's. This spot is a large collector's heaven. Boards and other litter are all over the ground plus rotting logs down near the meadow. I took a rubber boat, saw but lost a yellow-bellied racer down a rodent burrow, got Gerrhonotus coeruleus, Eumeces gilberti; many Sceloporus seen but warned eye and not easily approached with noose. By 5:15 I was at Cone Flat Ranger Station. Talked hurriedly with a ranger there and he told of seeing and hearing coon at Tioga Pass both day and evening. He believes cold snap (evenings) of last week keeping the troops down. Arrived Old Village 5:44 P.M., tired & hungry.

June 5 Left Happy Lake, Yosemite Valley 9:45 A.M. back-packing into little Yosemite area via the Merced Lake Trail. Pair of ♂ Sceloporus noosed side of trail below Nevada Falls. Weather clear and mild. Made camp at noon along Merced near junction Half Dome and Merced Lake trails. Caught two rainbows for dinner using brown buckler fly. 2 P.M. checked with cook at nearby trail maintenance camp. He mentioned pond just off Half Dome trail about $\frac{1}{8}$ th mile N of Merced River. I checked it out. No toads present but 4 young Thamnophis seen in pool. One captured. I continued around the NE sides of Liberty Cap and Mt. Broderick. Finally came upon large marshy area

E. L. Karlstrom
1954

Journal (28)

(Lost Lake)
June 5 NE base of mt. Broderick, 6100 ft., Yosemite Natl. Park, Mariposa Co., Calif. shown on topographic map Yosemite Valley area. meadow flooded, up to about 2 feet depth out in middle. See B. B. B. B. for description of locality. Weather sunny and mild. much downed timber here. Followed poor horse and deer trails back to my campsite. Two more garter snakes seen at large pond just mentioned. After supper I hiked eastward up the Little Yosemite Valley for about 2 miles. Level heavily wooded country. Wyla in tremendous numbers one pond on near north side of path about $\frac{1}{2}$ mile east of junction Sunrise Creek and Merced Lake Trails. Flood pools all along north side of Merced River but no amphibians here. These pools boggy, water brown stained. I fished along the River for about $\frac{3}{4}$ mile returning to camp. 4 rock bass and 1 rainbow gotten with brown bauble and California cockroach flies. Brushy along River and difficult to find suitable pools.

June 6 Had coffee and talked with trail maintenance crew camped along Sunrise Creek $\frac{1}{4}$ mile N of Merced River. None of men had recalled seeing a wood ^{little} in a Yosemite area, aside from tree "trunks." One young guy named Bob had interest in and some knowledge of herps. He promised a letter for museum (Yosemite) if he could get one. King snakes,

L. Karlstrom
1954

Journal (29)

June 6 garter snakes, an occasional rattler reported from this trail area by workers. These men come upon lots of herps while working the trails and they could be expected to encounter tracks if they are in area. I went up Half Dome late forenoon. Weather cold and sky cloudy. See Hydromantes for account of weather and area top of Dome. Returned to my camp 1 P.M. (1 mile E of) working down the merced toward Nevada Falls I found one adult 20" rattler killed within about 24 hours, probably by a fisherman. I found one Ensatina juvenile while working at base of Vernal Falls for Hydromantes. None of latter found. Cool afternoon with partially clear skies. Returned Hopper Lake 6:15 P.M.

June 12 Checked weather station Sentinel meadow 4 P.M. (D.S.)

Left Valley 4:45 P.M., speedometer 30530. I headed up ^{Hwy.} 140 to ^{Chiquapin} ~~Came Flat~~ (553), then Glacier Point Road to Paezoy meadow. Scattered showers Valley, heavy rain by Wawona Tunnel which continued all the way to Paezoy meadow. Light patches of snow (few) above 6000 feet along edge of road. This all that's left after snowfall early this week. Check weather station 6:15 P.M. (D.S.) after waiting in car $\frac{1}{2}$ hour for deluge of rain to slacken up. Clearing skies by seven, especially to West. Temperature in low 50's. I gave up heading out to Moriyasa since the storm let up and skies to west by 8

E.L. Karlstrom
1954

Journal (30)

June 12 o'clock were bright and clearing. The Glacier Point road was nearly dry by this time. Herded back to camp 19. Some low clouds still present along floor of Valley. made check of Sentinel meadow for tracks 9:15 - 10:30 P.M. Hazy moon glow, mild, mostly clear skies. One new adult ♀ marked.

June 18 Left Government Center 9:30 A.M. (D.S.) along with John Erickson. Initial speedometer reading 30606.4. Oak Flat Road to Hwy. 120, Tioga Road. Weather clear and warm morning. White Wolf meadows at start of Tioga mine Road 10:35 A.M. First signs of snow here, sparse patches under shade of lodgepole pines. Snow Flat, el. , speedometer 652.3. Flat clear of snow; scattered melt pools to 4-5" depth over meadow. Green grasses to 2" height. Little insect life in pools, no algae. No signs of tracks 11:15 A.M. (D.S.) when check made. Tuolumne meadows 12:20 P.M. (D.S.) Speedometer 664. Bright sunny day. Tioga Pass Ranger Station 1:10 P.M. (671.8) Still westerly breeze but clear skies. Temperature in middle 60's. Erickson and I climbed westward over ridge to Gaylor Lakes. Middle Gaylor Lake 9/10th covered with ice to 1-2" thick. Other lower lakes free of ice. Patchy snow. adult ♀ and juvenile tracks taken on path above Tioga Station. One medium-sized male collected along creek leading to Granite Lake. Returned to Tioga Station 6:15 P.M. I worked Tioga Pass meadow from 9:15 - 10:45 P.M. Day clear, temperatures ranged

E.L. Karlstrom
1954

Journal (31)

- June 18 meadows E of Tioga Pass Ranger Station, 9900 ft.,
Yosemite National Park, Tuolumne Co., Calif. between
2-5°C. Returned Tuolumne meadows about 11 P.M.
2/3 rd full moon in clear sky brightened up the
cold evening.
- June 19 Tuolumne meadows, Y.M.P. air temp. 5:30 A.M. (D.S.)
1.5°C 6" above dry ground. Sun not risen yet.
Sky clear. I recorded calls of various birds
5:45 - 7:00 A.M., mostly in area 200-300 yards
W of Merced River and our camp at A10. See
special "Recording notes." morning warm and sunny.
Temp. 13.5°C. (bulb shaded) by 8:45 A.M. at
9 I left for Tioga Pass. Warm and windy at
Pass. air temp. 14.4°C 1" above wet marshy area
(bulb shaded) 9:58 A.M. (D.S.). Adult B. coronatus,
eggs and tods taken. Snow patches over much
of meadow and lower hilly areas. Worked area
until 1:25 P.M. Left Tioga Pass on Hwy 120,
goes at Tuolumne meadows. Returned to Valley
4:45 P.M. (D.S.)

E. L. Karlstrom
1954

Journal (32)

July 10 Left Yosemite Valley 10:45 A.M. with family.
Gas at Lodge service station 13.0 gallons; mileage
reading 31582. Weather clear and sunny, in high
70's, no breeze. \$6.52 with oil charge. Took
Hwy 120 to Crane Flat, then Tioga Road. First
stop 31612 at start of 21-mile Tioga mine Road.
Weather clear and bright. Hyla toads abundant and Rana
adults (4) taken. Large $1\frac{1}{4}$ " Rana toads seen in pools.
Second stop 1:15 P.M. Snow Flat, NE side of
road. Hyla toads and both Rana adults & toads. Grasses
green, overgrowing 4" high. Brood over meadow with
small stream meandering thru it. 2 P.M. I checked
small lakes near Eratic Dome, $1\frac{1}{2}$ miles N-NW
of Tuolumne meadows. Mountain garter snake taken
along with B. boylii. Large bear at garbage pits.
Set up camp at Tuolumne meadows 2:30. Then
also evening check 8:30 P.M.
check of Tioga area. 3 P.M. Clear and very windy.

July 11 Left camp at Tuolumne meadows for Tioga Pass.
mileage there 31681. The weather mild and clear
but typical high velocity southerly winds blowing
over the Pass. Left Tioga 11:00 A.M. for Lee Vining.
N on U.S. 395 to Hwy 108 W over Sierra Pass.
Continued warm, clear day. Rapid drying out of
creeks and meadow pools at Sierra Pass area.
no carnivores seen.

Gas at Sierra (mileage 31821) 10 gallons, but tank
with 2+ gallons left. Weather clear and very hot,
in high 90's. Big Oak Flat Road to Yosemite ^{15 mi} 7 P.M.

$$\begin{array}{r}
 31821 \\
 31582 \\
 \hline
 239
 \end{array}$$

$$\begin{array}{r}
 14 \\
 15 \overline{) 239} \\
 \underline{15} \\
 89
 \end{array}$$

L. Karlstrom
1954

Journal

Yosemite Valley

Aug. 2 left Camp 19 ^{Yosemite Valley} 8:30 A.M. (D.S.), speedometer reading 32132. Weather clear and fair but some smoke over Valley from forest fires. Gas at Crane Flat (1418). Arrived Tioga Pass Ranger Station 10:50^(145.5) A.M. High country dry in spite of rains of about a week ago. Temperature in low 70's, windy, sky with scattered light strato-cirrus clouds. Collected mostly juvenile Bufo cervinus but some adults. Tree-frogs and yellow-legged frogs also taken in the meadow. Sky remained partially clouded until time I left at 3:50 P.M. (D.S.) Drove straight thru to Valley except for one brief stop 5:15 P.M. at Swamp Lake, 8400 ft., on Hwy 120, 9 miles NE Gin Flat, Tuolumne Co., Calif. 3 mountain garter snakes taken. No toads but numerous Rana along lake edges. Returned Camp 19, Yosemite Valley 6:20 P.M.

Aug 30 Short day-long trip from Yosemite Valley to Tioga Pass, 9920 ft., Tuolumne-Mono Co., Calif. Arrived 10:05 A.M. (D.S.) at Pass. Usual high wind, sky partially cloudy light cumulus type formations. Sun out most of the late morning and afternoon, and half intensity when behind clouds. See species account for air temperatures. Returned to Valley 5:30 P.M. Adult cervinus plus some juveniles collected. Rana boylei also taken.

ELKobstun
1954

Journal

- Oct. 16 Left Berkeley 6:30 A.M. (mileage ~~33~~ 33252) accompanied by Dick Russell. Merced 9:10 A.M. (379.1) for gas and breakfast. Full tank (11.5 gal.) \$3.55. Valley overcast light clouds, mild temperatures, in 70's by 9 A.M. Arrived lower end of Yosemite Valley 11:30 A.M. (Dick suggested cutoff around Mariposa via Hwy. 49. This road paralleled creek, now dry, and looked like good upper Sonoran oak woodland here country.) We headed up Tioga Road for the Pass. Dazy sunshine most of way. Some smoke in area from "range improvement" controlled burning in the foothills. Yosemite creek ^{that has Sierra Lake. Run only.} was dry but small flow in Porcupine Creek. The quaking aspen gloriously yellow-gold now. Tuolumne and other alpine meadows or snow flat all browned out. Arrived Tioga Pass 2:10 P.M. Wind here to 30 m.p.h. gusts. Air temperatures in 50's. Mostly sunny but some light stratus clouds above. No tracks collected or seen. Some Hyla, but Rana were taken from pools. Water in pools and rivulets increased over Aug. 30 visit. Returned to Yosemite Valley 6:15 P.M. California toads and Hyla collected 9 P.M. in front of Ranger's Club. Oak leaf litter here. One adult ♀ taken at Stems Meadow after 11 at night. Evening clear and cool with some mist over the meadows.
- Oct. 17 Return Berkeley via 140, 99, 133, 50. Stop along draw 1 mile above Briceburg on N-facing slope. Rana seen.

EL Karlstrom
1954

Journal

Nov. 13 Left MUZ in Alden Miller's station wagon for day-long ornithological expedition with Dr. Miller, Bob Selander, Goudge, George Lawrence and Dick Russell. San Rafael-Richmond ferry crossing. Weather clear and mild with slight westerly breeze on Bay. Western and California gulls observed at dock and during crossing. Also lesser scaups, double-crested and Brandt's cormorants. Stopped to view shore birds and ducks San Rafael marsh. Other birds seen pasture land opposite side of road included sparrow hawks, Song's phoebe, crows. Ducks mostly far off shore, this being last Saturday of a split duck season. Scaups most evident but some gulls. County road shore birds included:

western sand-piper (flocks of hundreds)

red-backed " (fewer)

least sandpiper (very few)

dowitcher

marbled godwit, western willet

avocet

Hudsonian curlew

Killdeer, black-bellied plovers.

coots

American egret, short-billed gulls.

Continued along county roads NE from San Rafael through San Geronimo to San Taylor State Park area. Stop here in Bishop pine forest where Bob Norris had studied nuthatches. Still clear

EL Karlstrom
1954

Journal

Nov. 13 mild weather with no breezes. D.O.R. golden-crowned sparrow and a varied thrush between San Bernardino and Cong Taylor. Species encountered mostly by Miller's identification of voices)

Pygmy nuthatch (heard)

Fox sparrow

~~phoebe~~

Golden-crowned kinglet

Brown creepers

Hutton's vireo

Stellar's jay

robin, hairy woodpecker

pixit

wen-tits

bush-tits

From Olena we drove up W side of Tomales Bay to road's end near McClure's Ranch, then hiked down draw (stem running) to McClure's Beach. On ridge overlooking Tomales Bay we observed many hawks, a blue heron, and deer on the grassy hillsides. marsh hawks.

American rough-legged hawk & red-tailed

Great blue heron

at ocean the tide low, slow rollers but no breeze, mild 3-5 afternoon.

Red phalarope (winter plumage)

Heermann's gull, glaucous-winged, westerns and Bonaparte gulls. Forster tern, short-billed gulls

Brown pelicans, surf scoters, gullenots, western grebes way offshore.

Oystercatcher (pair) on rocks off shore working in mussels.

Returned Berkeley 7 P.M. same route taken.

Ernest L. Karlstrom

1954

Species Accounts

Amphibians

Bufo boreas

Bufo canorus

Bufo boreas X *canorus*

miscellaneous

Reptiles

Mammals

Amphibians

Bufo boreas

E.L. Karlstrom
1954

Bufo boreas (1)

April 8 El Capitan Meadow, 3950 ft, Yosemite Valley, Yosemite National Park, ^{Marysville Co.} California. 10:40 A.M. Chuckie and I investigated a meadow pool lying on the near south side of the road which leads up the Valley at the base of El Capitan. The pool is about 85 yards long and 28 wide. Its maximum depth about



18-24 inches. Water clear with sandy-silty bottom. Sparse growth of green grasses along edges. The meadow itself is brown with first bits of annual grass growth up to 6 inches in height. Meadow is relatively open at this locality with scattered pines to 60-70 feet tall. Maple and some oak trees at margins of pool and over meadow. No new foliage on any deciduous trees. New buds are just appearing on oaks. Margin of meadow is Merced river to the south

E.L. Kuhlman
1954

Bufo boreas (2)

April 8 and heavy stands of pine (ponderosa) to the east. This pool may be a breeding site for Bufo? (not used 54 & 55) no snow patches this area and no standing water low areas. The ~~snow~~^{ground} is completely thawed out, and the fresh dirt mounds thrown up by pocket gophers indicate the softness of the soil. At 11:45 A.M. water temps. were: surface 15°C ., 6 inches below the surface 14° . The sun is intermittently bright and then hazy. Air temp. (shaded bulb) a few inches above the ground 22°C . Clusters of Hyla eggs taken along with some small Hyla toads (see Hyla species account). Many insect larvae here but little algal growth.

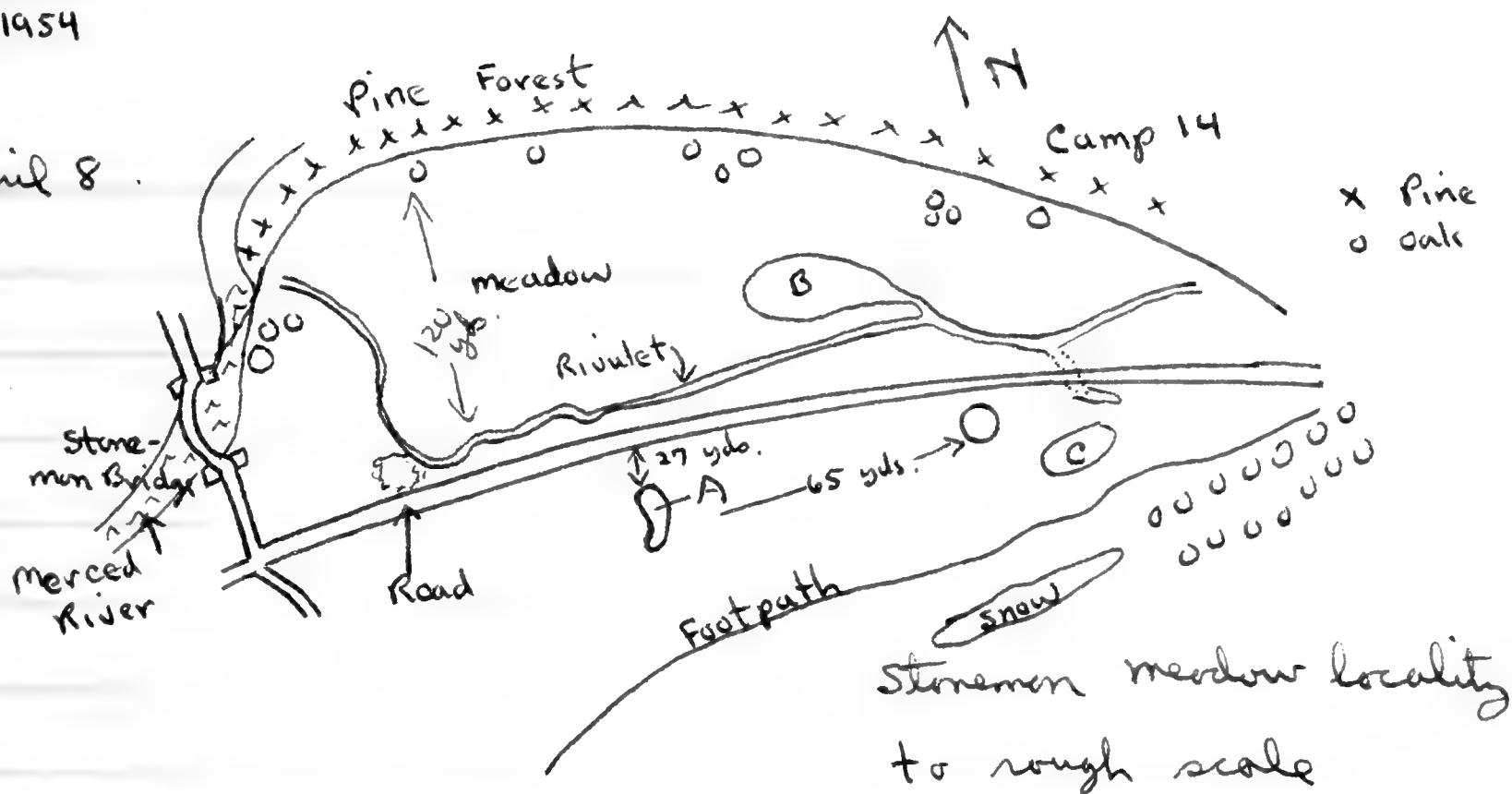
Stoneman meadow, 4000 ft., Yosemite Valley, Mariposa
Co., Calif.

R. Stebbins had reported seeing both Bufo and Hyla in this meadow ^{during previous years}. We checked this locality at 1:45 P.M. The road runs NE here from Stoneman Bridge. The meadow is approximately $\frac{1}{4}$ mile long between the Bridge and Camp 14 to the E, Camp Curry to the S. Even after the winter snows the meadow shows a maze of criss-cross footpaths. A rivulet of running water passes SW along the N side of the road (see map). At least 3 pools of standing water are present, B being the largest. Water temp. pool B was 14°C . It was 8° flowing rivulet near pool B.

E.L. Karlstrom
1954

Bufo boreas (3)

April 8



Hyla egg clusters and small toads found in pools but none in faster moving colder rivulets. no sign of toad eggs or adults this afternoon.

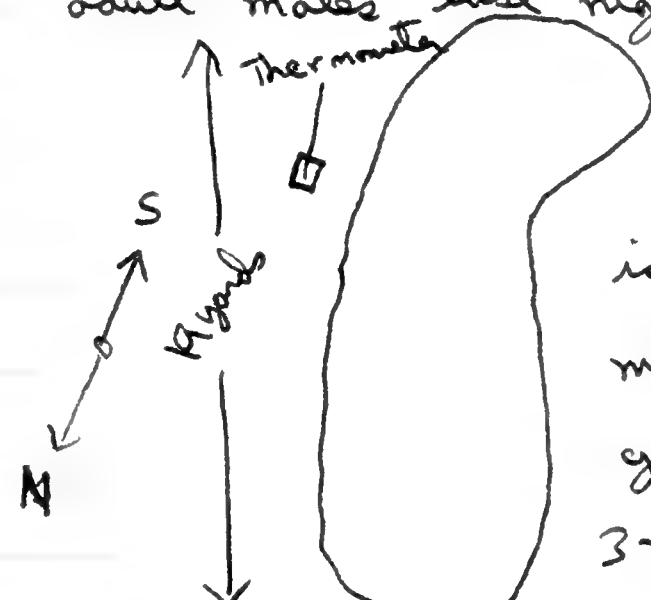
Same locality 9:30 P.M. I checked ponds B and C first. Hyla choruses loud. at pond A I found two adult $\sigma \rightarrow \sigma$ Bufo within a yard of each other. Cloacal temp. 8° . Water temp. 9° C. and air 2.5° C. Six inches below the surface the soil temperature was 8° C. The water temp. in pond B earlier had been 10° C. I could not determine whether the male toads were calling since many Hyla in the pond were croaking. When picked up the toads gave a short bleating note. at 9:45 P.M. I found a single adult male about 8 feet NE of the pond. It was moving slowly over the grass toward the pool of water. Cloacal temp. registered 5° C. Later two more adults were seen in another part of the pool, there in 2-3

inches of water.

E. L. Karlstrom
1954

Bufo boreas (4)

April 9 Stoneman Meadow, 4000 ft., Yosemite Valley, Yosemite National Park, ^{Marys Valley} Calif. 11:30 A.M. Norm Herkenheim and I set out the maximum-minimum recording thermometer at Pond A (see map) where I collected 5 adult males last night. This pond crescent-shaped 19 yards long with a maximum width of 12 feet. It is a depression in the meadow itself with the grassy hillocks on its sides 3-4 feet above the level of



the pond. This is probably a snow pool possibly fed by underwater springs. No moving rivulets enter or leave it. Maximum water depth 4 inches. Mounds of grasses break up the surface of the pool, rising up to 15" above the water surface. The slope of the edge is steeper on the west side. Where I found the adult male toad approaching the pool the slope is about $3\frac{1}{2}$ feet in 14 feet. The slope is more gradual at other points. Brown dead grasses lying flat or in clumps dominate the meadow but new green grasses (2-3" high) are coming up. The pool has still green blades here and there of what may be annual grasses. The thermometer is located 3 feet from water's edge 6" above present surface of water. It faces N. and is enclosed 3 sides by a cut down apple box.

E. L. Karlstrom
1954

Bufo boreas (5)

April 9 At 12:20 P.M. water temp. below surface was 26°C . Air temp. 19° . 6-7 inches below soil surface in soft moist loam 8°C . I took 2 pictures of Pond A facing NW (#3 & 4 on plus-x roll).

April 13 Color notes taken morning April 13, 1954 at MVZ. Adult toads have been kept individually in jars with small amount of water at the bottom - these kept dark cold room $42-45^{\circ}\text{F}$. since last Friday night. I can see no appreciable change or loss of color or pattern.

ELK 158 adult ♂♂, body length 82 mm. The ground color is Piping Rock Gray Stone (Pl. 13, A-2 Maerz & Paul). The most striking feature is the almost complete absence of a vertebral stripe. Between

the parotoids a lighter gray line

(< 1 mm. width) is present not more than 18 mm. long. There is no stripe in the middle of the

$\times \frac{2}{3}$ back but it appears again in the sacral region extending $\angle 16$

mm. here and not more than 0.5 mm. wide. The roundish warts on

the sides of the body (avg. 2 mm. width) are Yucatan (Pl. 12, L-9 m & P). Dorsally the warts tend to be darker, more of a Russet (Pl. 14, I-12) to Cinamon Br. (Pl. 14 I-10) lumpy black blotches surround the warts and the centers of the warts may



E. Karlstrom
1954

Bufo boreas (L)

April 13 he flicked with black. Paratoids on Cinnamon Cr.
(Pl. 14, I-10)



left paratoid shown here

x $\frac{2}{3}$

I injected this specimen with m.s. 222 solution.
0.5 cc. of 10 mg./cc. strength, at 9:23. Five
minutes later his respiratory rate was $\frac{1}{3}$ normal,
no righting reflex. I left it for an hour to attend
ecology lecture. Animal recovered and had to be injected with

ELK 159 adult $\rightarrow \rightarrow$ body length mm. 11:20 A.M.

I injected 1 cc. m.s. 222 (10 mg./cc. soln) & no
righting reflex within 2 minutes although leg
reflex strong. Animal released for study. Suggest
 $\frac{1}{2}$ to 1 cc. of the anesthetic for killing
specimen fast. Dorsal ground color close to
Troxertine (pl. 14 F-3 M&P) otherwise color
similar to ELK 158 just described. Ventrals

are an off-white (possibly

pl. 18 B1, M 28) with a

rusty suffusion ventral

region. Throat looks black spots

for the most part. Same for under-

parts of four limbs. The

maxillary cornification well

developed and dark brown in

color. Rt. testis 5.3 mm. long

3.2 mm. wide. General

appearance is golden-yellow and shiny. The left



E. L. Karlstrom
1954

Bufo boreas (7)

April 13 testis is larger, 7.2 mm. x 4.1 mm. I found no signs of food in the stomach which would be expected for animals retained alive for four days as these have ~~been~~. However, the colon contained some dark chitinous appearing pieces. I preserved the colon. Under the dissecting scope the thorax and abdominal segments of some insect were clearly visible. The water at the bottom of other jars clearly contains broken pieces of insect material. These male toads obviously have fed prior to their capture. It is difficult to predict for how many night (or how long) they have been out from underground sites.

April 14 ELK # 158 shows no harmful effects of the aresthesia. I injected it again with lethal dose of m.s. 222 solution. Left testis 9.7 x 3 mm. Rt. testis 12.8 x 3.2 mm. ~~Body~~

ELK # 160 - Body length 81 mm. ♂♂
shows the greenish brown ground color of 159. The underparts are darker gray-white with smaller but more numerous black ~~blotches~~ blotches than 159. The dorsal vertebral stripe is clearly distinct and creamish in color. It has a maximum width of 1.5 mm. LT 7.3 mm. x 3.1 mm. RT 11.0 x 3.0 mm.

ELK 161. Body length 90.5 mm. This large ♂♂ shows a olive drab green ground color (Pl. 21, E1, M & P) Gray Drab. The distinct vertebral stripe

April 14 is nearly the same shade but lighter. Maximum width of stripe is 3.5 mm. in region between parotoids. Dorsal black blotches are large (largest 1 cm. across) and distinct. RT 11.1 x 3.6 mm. LT 7.8 x 5.2 mm. The fat bodies are fairly well developed this ~~from~~ specimen or one three in the others of this series.

ELIC 162 similar coloration 159 & 160. Vertebral stripe is thin, cream-white and distinct throughout its length. Body length 91 mm. LT 12 x 4.1 mm. RT 11.8 x 5 mm.

April 15 Analyzed pond water samples for pH. Used pHydium papers two ranges, one 5.2-6.6 and other 6.0-8.0. These were tested against standards using Thymol Blue method. Degree of error probably ± 0.2 of one pH unit or less.

Stoneman Meadow, pond A pH 6.8

Between Sentinel Bridge and Camp 6,

SE side of road. Boggiest-looking pool ~~7.0~~ 6.6-6.8

Same locality but pool where Hyla breeding 6.4

It would appear that the boggy pool which had no Hyla breeding in it does not have any possible adverse pH range. O₂ capacity may then be a limiting factor (?)

April 14 I had weighed out a soil sample taken from Stoneman meadow, 2 inches below the soil surface 8 feet WNW of pond A. Sample collected April 9 and kept sealed in jar. A sandy black loam

E.L. Karlstrom
1954

Bufo boreas (9)

April 14 charged with flakes of mica or pyrite.

Wt. wet soil & dish 138.92 Wt. dry soil & dish 105.65

Wt. dish 43.55 Wt. dish 43.55

Wt. wet soil 95.37 gm. / Wt. dry soil 62.10

95.37

- 62.10

33.27 gm. wt of water content.

$\frac{33.27}{95.37} = 34.9\%$ ^{water} ~~saturation~~ by weight.

Above sample was dried until April 17th in open flat dish at room temp. or slightly above (on window sill in sun).

From Joe Gorman's notebook:

April 15 Pond A, Stoneman mdr., Yos. N.P., Mariposa Co., Calif.

8:10 P.M. Reading on max.-min. now 51°F . On (proxid recording thermometer 11.9). Recorded max.-min. readings 84-31. Reset. Loud dense Hyla regilla chorus, but I think I hear one Bufo about 4-5 meters NW. 8:30 P.M. Walked around pool. Temps. 11.7, 11.8, 11.6, 11.5, 11.4, 11.7. Found 14-17 mature ♂, 2-3 ♀(?) toads. Two ♂ were clasping two other ♂'s. In a small pool about 5-6 meters x .4-.6 meters I found four mature ♂'s, 1 immature? ♀, and 1 immature ♂ clasping a mature ♀. Water temp. around them 16.4°C . although $13.8-16.4^{\circ}\text{C}$. other parts of the pool. Temp. of ♀ 17.0° , of ♂ 16.6 or 16.7°C .

L. Karlstrom
1954

Bufo boreas

April 13 Stoneman meadow, 4000 ft., Yosemite Valley, Mariposa Co., Calif.

check of weather station made by Norm Hekman and Joe Gorman:

Air max-min. April 13, 10:00 P.M.

84-23° F. One adult ♂ seen. no eggs yet. Many Hyla.

April 15 (Joe Gorman) 8:10 P.M. present air max-min.

51° F (check with quick-recording thermometer 11.9°C.)

max-min. 84-31.5° F. Dense Hyla, no ♀'s seen (see Joe's ^{April 15} notes)

April 17 3:15 P.M. Present air reading 81.5° F. (check RR thermometer 26.6) max-min. 86-35° F.

E.L. Karlstrom
1954

Bufo boreas (10)

April 15 In another even smaller pool (.6 ~~x~~ .8 m. x 3.5 or 4 m)
4 mature ♂, 1 immature ♂, no ♀. Joe's not
certain whether some of the immature are ♂ or ♀
but if ♀ then not gravid. A third pond, still
moving easterly (5 x 1.2 m.), had 5 males. 2 mature
were clasping, 3 immature. Some of the toads are on
the banks about .2-.3 meters from water. Most ^{by far} are
in the water about some distance from the edge. Temp.
lost pool 11.6 - 11.9 °C.

9:05-9:20 P.M. A quick check thru half the
area near Sentinel Bridge. The same picture, ♂
toads and Dryas. No ♀, no eggs Bufo. Temp. lower
10.8 - 12.4 water; 10.4 - 10.8 air.

April 17 3:20 P.M. Storönan mdw. locality again. Pond A.

Bufo eggs in N end. Water now 24.5. air temp.
at ^{thermometer} max.-min. site 26.6. The water at



the box covers the base of it but not
the thermometer. Water temp. at box

27.2 °C. (note that water level has

risen few inches since I had placed the box
3 feet from water's edge and 6" above surface ^{11"}
at that time [April 9] ELK) Next time measure
rise. Since weather has been warm in Valley it
must be that underground seepage or flow is
extensive at pond A to account for rise in
water level. (Water 3/4" from thermometer bulb - 56)

max.-min. reading 3:20 P.M. 81.5. The maximum
and minimum readings (since April 15) 86-35° F.

E.L. Karlstrom
1954

Bufo boreas (11)

April 17 Eggs in long double strands over a space about .5 x .7 meters, both jelly masses and black beads on the same string. Sample taken.

In farthest SW pond (3rd of E-W series beginning just south of pond A) 3 Bufo amplexing, 20+ large ♀ laying eggs. Water 24.1°. Hyla egg masses in water.

In first of 5 ponds one very recently torn open Bufo. In second, another, but just skin left. Another skin in 3rd pond. Joe suspects predation—possibly owls. Skins were fresh. Raccoon?

April 19 I looked at egg string Joe had collected. No evidence of cleavage and fully $\frac{3}{3}$ rds of eggs showed signs of decomposition. These probably not fertilized. Better sample needed for drawing and study.

E.L. Karlstrom
1954

Bufo boreas (12)

April 24 Stoneman mdr., 4000 ft., Yosemite Valley, Marysville
Co., Calif. 4:40 P.M. Pond A and other adjacent
ponds searched for eggs and toads. No eggs present
but some of the ponds have large numbers of toads -
both Hyla and Bufo. Samples taken including both
with approximate ratio if sampling with net at random.
Water temp. Pond A 21.5°C. with bulb shaded. A
long trough 11 yards SE of Pond A loaded with
toads. This pool measures 14 x 2 yards and parallels
the pathway bisecting this side of the meadow. Air
temp. 13°C. The max-min. thermometer is submerged
3 inches in water. This means approximately a ~~5°F~~
inch rise in level of Pond A. Max-min. readings
at 4:55 P.M. 32-84. The thermometer bulb was
5" above water surface. Water temp. Pond A 4:52
P.M. 20.4°C. Sky clouded over again. I found no
eggs in Pond A nor adjacent ponds.

Soil temps. 5:05 P.M. Surface about 15°C.

6" depth 13.0° Air temp. 5:15 P.M.

12" " 11.0° 12.3°C.

18" " 10.5°

24" " 9°C.

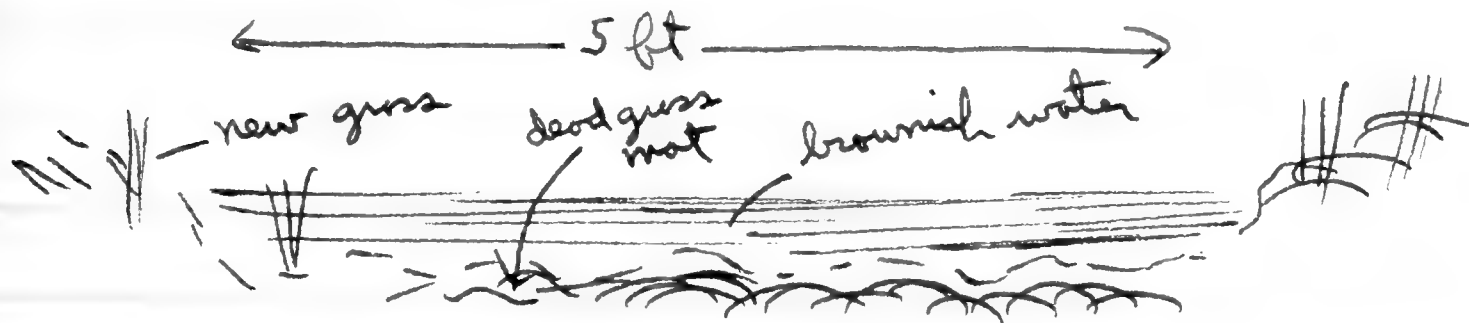
Meadow area S of Govt. Center, Yosemite Valley
Marysville Co., Calif. 7:45 P.M. Stebbins and I
checked this area thoroughly for signs of toads.
An earlier check (6:30-7:00 P.M.) showed that
extensive and varied breeding pools available.

L. Karlstrom
1954

Bufo boreas (13)

April 24 Stoneman mdr., 4000 ft., Yosemite Valley, Marysina
Co., Calif. meadow 150 yards N Camp Curry.
(notes from Stebbins) Quiet pools in low areas
in meadow, water 21°C. , 4:35 P.M. numerous
Hyla and Bufo toads. Bufo toads in pond A
farther advanced than those in pool 40-50 ft. to
S. Water of two pools not connected. Air 1"
above dry grass (sky overcast) 14.4°C. at
4:40 P.M. Black humus filled loam (where
pushed up by gopher?), water saturated, squeezed
easily from soil. Soil as saturated as that at
Peregrino today. Temp. soil just under surface
 17.4°C. Grass of mdr. 2-5" high, sparse,
much matted dead grass showing. Scattered dead
thistle stalks. Many (10-12) robins seen about
pools, possibly gathering mud and other nesting
materials (or feeding?) Brewer's blackbirds about,
one seen bathing.

Pool where smaller toads found (sample preserved)
9" deep (max. depth).



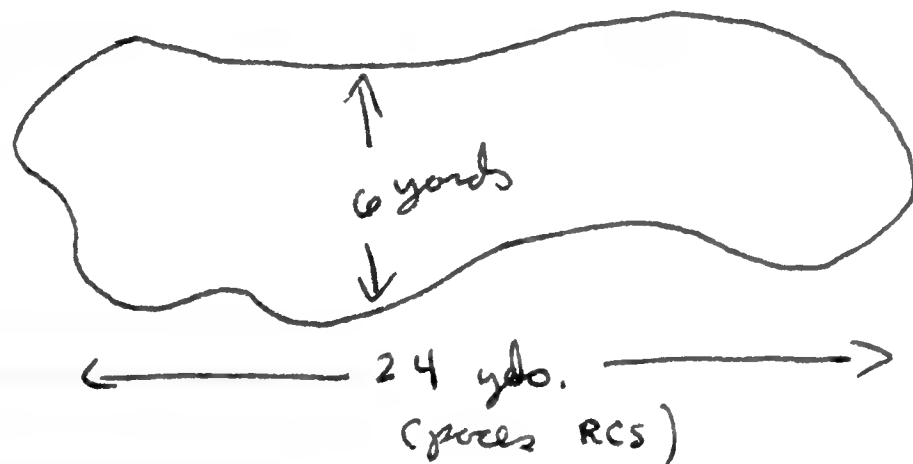
many toads attached to dead grass blades & piece
of paper in water.

E.L. Karlstrom
1954

Bufo boreas (14)

April 24 Stoneman mdr., N. Camp Curry, Yos. Valley,
Mariposa Co., Calif. max. reading 84° F. } 5"
min. " 31.5°

above surface of water pond A. Pond level had
risen so that part of thermometer under water.
(see p. 12 of B. boreas species account). Water
20.4° C. at 4:52 P.M. This pool had Hyla
tads half way to metamorphosis (?) but others
smaller and Bufo tads (some preserved) larger
than preceding pool. Pool now 10" at greatest
depth. Hyla chorus heard in distance. Hyla also
heard from mole (?) burrow around pools.



Pond A.

Preceding pool was about 21 paces long x 1½-2
paces wide. Pool shapes:



Advanced Hyla egg masses (4-5) seen in one pool.
A long string of addled toad eggs in one
pool. String with algae growth. Water in
ditch 4-6 ft. wide 8-10" deep, moving 10.6° C.
at 5:15 P.M. Sky overcast. Site ditch that

E.L. Karlstrom
1954

Bufo boreas (15)

April 24 Stoneman mdr., 4000 ft. Yosemite Valley.

parallels road immediately N of pond A; site N of road 50 ft from it. No toads or eggs. Orchard at NE edge of meadow. Apple trees in full bloom, with new leaves. Black oak reddish brown leaves and catkins - just coming out (some) Black cottonwood yellow green leaves, just out.

April 25 Out last night to check Stoneman mdr, meadow $\frac{1}{5}$ mi. S of Govt. Center and one SW of Old Village. Many Hyla chorusing but no toads. Stebbins and I worked 7:30 - 9:30 P.M. with headlamps. ~~no~~ no toads except toads at Stoneman previously noted. Stebbins took photos of pond at Govt. Center locality looking W toward Bridalveil area. Also photo looking toward Half Dome. Air 12°C , water 14.5°C . 8:30 P.M.

Took sample of pond life from edge of pond 175 ft WSW of study pond. This pond in full sun all day. Made two long sweeps of 6" wide net in shallows NNE side of pond. Net scooped thru dead grass at pond's edge. 10:30 A.M. (D.S.) Water temp. 15.6°C . ($\frac{1}{4}$ " under surface, $1\frac{1}{2}$ feet from pond edge) Air temp. 1" above dry dead grass surface, 6 ft. from edge of pond 21°C . gusty light breeze (hills shaded). Area fully illuminated. Temp. just under saturated soil surface 12 feet from above pool 26.3°C .

E. Karlstrom
1954

Bufo boreas (16)

April 25 meadow $\frac{1}{5}$ mi. S Court. Center, Yos. Valley, Mariposa
Co., Calif.

Stebbins added to previous pond sample toads from pool immediately west of pathway cutting SSE across meadow. From W pool also preserved in some jar algae (floating - pale yellow green & and deeper grayish brown with green cast forming "clouds" on bottom of pool) and floating moss (?). Rel. little dev. algae to this date. Pool E of pathway probably less than $\frac{1}{100}$ of pond surface (floating dead grass excluded). Including grass probably $\frac{1}{4}$ - $\frac{1}{3}$ surface covered. Western azalea

Willow-like (not Salix) clumps near study site 5-8 ft. high, no leaf but flower buds about to open. Red-winged blackbirds these ^{thickets} or water carried piles of dead pine needles partly blown ^{into} clumps but probably also brought there by woodrats (?) form hummocks at base of bushes. Willow-like clumps on higher ground. This and rodent tunnels could attract toads.

Numerous sow bugs and some spiders under fire wood blocks at base of one of the willow-like clumps. Blocks partly covered by dead grass & leaves. Leaf litter wet underneath. Looks good for toads. Wild blackberry mingled with the willow-like clumps. Sedges in ponds to 1 ft. above water surface, average 6". meadow grass

E. Karlstrom
1954

Bufo boreas (17)

April 25 $\frac{1}{5}$ mi. S. Govt. Center

averages 4" high (2-8") scattered dead stalks of thistle present, new plants form rosettes 6-8" across, 3-4" high, no stalks. Wild rose freshly leafed out on S side meadow near study site. many earthworms in soil of meadow.

Relative humidity readings:

WB	51° F.	} at edge of pond partly over water surface 11:55 A.M. (D.S.) overcast.
DB	58° F.	
10" above ground		

WB	51° F	} 28 paces S of study site under pines, grass surface dry, overcast sky., breeze 11:50 a.m. (D.S.)
DB	58° F	

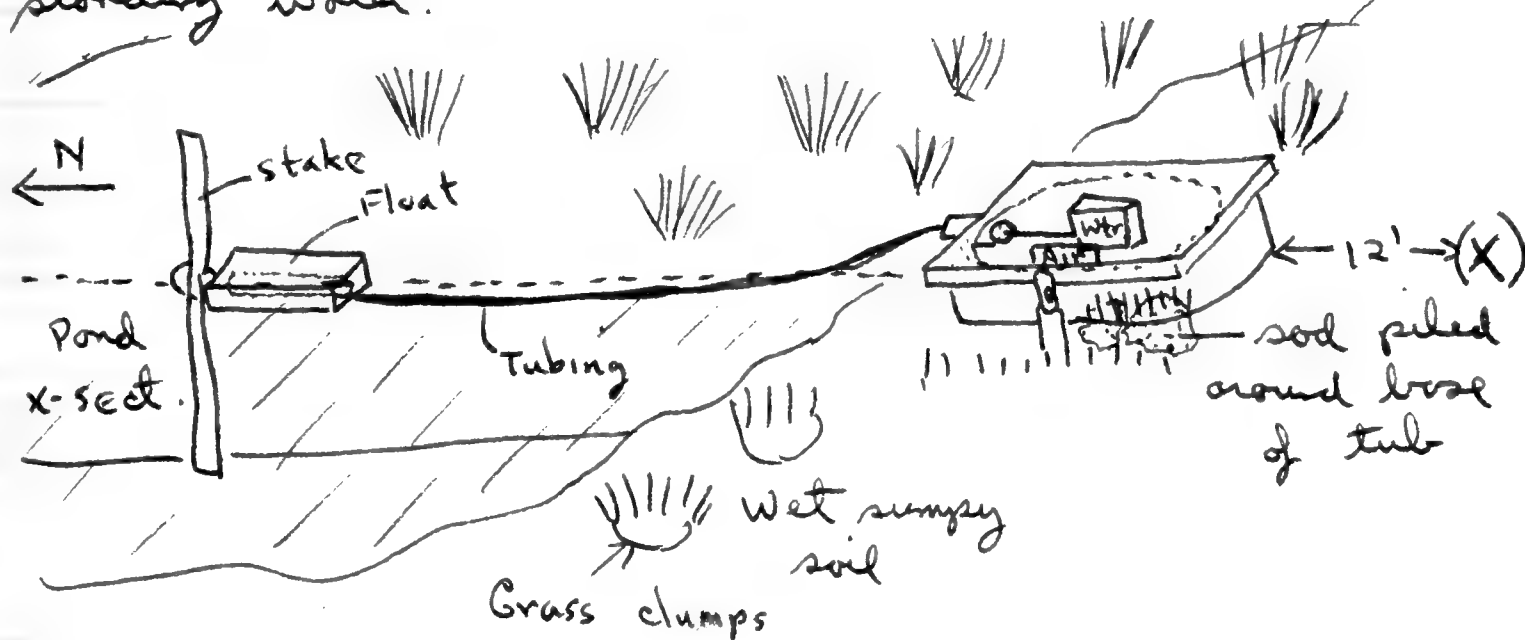
12:00 M (DST) 15.1° C. water of study pool (shaded yellow pine) $\frac{1}{4}$ " under surface where water 10" deep.

17.4° C. water of pond sample pool 175 ft. WSW of study pool (continuously in sun)

E. L. Karlstrom
1954

Bufo boreas (18)

April 25 $\frac{1}{2}$ mi. S Govt. Center ^{4000ft.}, Yosemite Valley, Yos. Natl. Park
Mariposa Co., Calif. Stebbins and I worked 9:30 A.M.
(Daylight Savings) until 1:00 P.M. setting up the
weather station. Photos taken of the station. Water
depth where the float staked out 19". Present length
of stake above the water now 6 $\frac{1}{2}$ ". The galvanized
tub containing 2 thermographs (air and water [soil])
set on the grass surface with water 1 inch up
around its base. The lead tubing for the water
recordings extends 8 feet N from the tub. The
open spout from the tub is 4 inches above
standing water.



Soil temps at (X) above 1:00 P.M. (D.S.)

6 " - 12°C. (53°F.)

12 - 11°C. (52°F.)

18 - 10°C

24 - 10°C

Water wellled up
as at Peregoy mdr.

Weather station containing max-min. set 18' SE
of tub. One max-min. placed in soil a foot
NW of weather box.

E.L. Karlstrom
1954

Bufo boreas (1a)

May 1 $\frac{1}{5}$ mi. S Govt. Center, 4000 ft., Yosemite Valley, Mariposa Co., Calif.

Few ^{Hyla} tadpoles in study pond. No egg clusters seen. I collected a sample of Hyla tods. Estimate fewer than one per square yard over the entire pool. More on shallower S and SW side where blue-green algal development further along. In general algal development not well along, about same as April 24. At 11:05 A.M. (D.S.T.) $\frac{1}{3}$ of study pond shaded including temperature equipment. Water temp. 1" below surface 11:10 A.M. 8.1°C . (cloudy area of pond) Some sunny part 13.8°C .

Stoneman Meadow, 4000 ft., Yosemite Valley, Mariposa Co., Calif.

Tods collected 11:50 A.M. (D.S.T.) at same pond Stebbins took them last week. Water 1" below surface 18.2°C . Air (bullb shaded) 13.6°C . No Bufo or Hyla eggs present. Additional pools formed by recent rains. Sample of Bufo & Hyla tods from Pond A and adjacent newer pond to W of Pond A. Water temp. 1" below surface near Pond A 17.8°C , Air 12.6 (bullb shaded). Depth of pool here 3-4". Robins today near or at meadow pools feeding or gathering nest materials(?) The meadow grasses here in similar condition as those at Government Center, some green blades over a foot in height. Additional small seepage (rain?) pools present this meadow. Actual water rise in pool A since April 24 not more than an inch or so.

L. Karlstrom
1954

Bufo boreas (20)

May 1 $\frac{1}{5}$ mi. S. Crest. Center, 4000 ft., Yosemite Valley, Mariposa Co., Calif. 9:45 A.M. Some frost on the grass surfaces in shade even at this hour. Overall appearance of the meadow is predominantly green with new grass (lots of sedge) 6-15" tall (av. 8-9") A close look at any one meadow area (about 10 ft. square) shows that the surface area is still 60% covered with dead matted grasses. Fruiting bodies on the sedges ^(anthers brown) are out and shedding. Valley deciduous tree growth shows a good sprout or new yellow-green foliage on oaks. Black cottonwoods appear fully newly-leaved out. Blackberry bushes to 10' height. New buds $\frac{1}{2}$ " long. Willow-like bushes in study site area but no new leaves as yet. Dried sepals (5) and covering of corolla present terminal twigs of these bushes.

Soil temp 10:15 A.M. (D.S.T.)

surface 8.0° C.

6" - 7.5° C.

12" - 8.5° C.

18" - 8.9° C.

24" - 8.2° C.

Few Hyla calling pools SE of site. Many red-winged blackbirds active in area, also oven woodpecker in oaks to E.

Psychrometer reading 11:00 A.M. (D.S.T.)

Initial 54° - after WB - 46°

DB - 54°

L. Karlstrom
1954

Bufo boreas (21)

April 30 Stream near 4000 ft., Yosemite Valley, Merced Co., Calif. Night check for toads 8:50 P.M. (D.S.T.) Air 1" above ^{dry} dead grass 6.1°C, water in pond A 11°C. No signs of adults or recently laid eggs. Toads present but not abundant. Hyla out and raucous. One pair captured in amplexus.

May 1 1/2 mi. S Govt. Center, Yosemite Valley
~~Some locality.~~ Equipment at study site in good shape. Top of the stake on which the float rides in the pond 5 1/4" inches above water surface, indicating a pond rise of ^{~1 1/2} inches. This put the lower edge of the tube spout about 2 1/2" above surface water. Standing water now approximately 21 inches deep (max.), although not more than 1" deep where my footprints have sunk into the soil.

Air max-min. (bulb 10" above ground) at 9:39 A.M. (D.S.T.) 28-74°F. Painted wooden housing, reset thermometer and replaced. The temp. equipment is now mostly shaded by yellow pines ^{20'} to the E of the weather box. Estimate 80% shade since some sunlight filtering through pine foliage. Present air temp. 46°F. max-min.

Soil max-min. not available since I found this thermometer broken. It was laid face downward and soil above carefully replaced April 24. Some metal housing will be necessary. Moved broken housing.

The air and pond thermographs operating well. Wait and replace charts this afternoon before leaving Valley.

E. L. Karlstrom
1954

Bufo boreas (22)

Stoneman mdr., 4000 ft., Yosemite Valley, Mariposa
Co., Calif.

Resume of growth of toads this meadow. Joe
Borman reported amplexing toads the evening of
April 15. I had seen adults σ^2 out the evening
of April 8 but no ♀♀ 's.

By April 8 - early emergence of σ^2

" " 15 - breeding pairs and ~~eggs laid~~

String of eggs Borman brought back to MVZ
April 17th apparently unfertilized since no cleavages
noted.

April 24th Toads collected Pond A and narrow
ditch-like Pond "B" SE of A.

Mean overall length	10 toads	Pond A	8.9 mm.
" body	" " " "	" "	3.9 "
" overall	" " " "	B	9.2 "
" body	" " " "	" "	3.9 "

May 1, 1954 for above measurements	Pond A	11.2
	" A	5.02
	" B	11.0
	" B	5.1

May 7 (From R. Stebbins' field notes) Water 18.7, air
1" above ground, 2" from edge of pond over dead
covered dead grass 11.0 °C.; 10:10 P.M. (D.S.T.)

Many Hyla calling but no toad eye shines.
Walked over meadow S of road thoroughly. Some
of pools had foam on top, not noted several

E.L. Karlstrom
1954

Bufo boreas (22)

May 7 Stoneman mdr. 4000 ft., Yosemite Valley, Mariposa Co., Calif. (from RCS field notes) weeks ago. also water trap. in pool where smallest Bufo tods found 2 weeks ago.

May 8 Water 17.7°C ; air $\frac{1}{2}$ " above ground in damp place next to pool 8.7°C . 9:40 P.M. Oil on water. Tadpoles dead. Saw-whet owl calling from trees at E edge of meadow.

May 9 Few tods (Uta and Bufo still alive in above pond. One Bufo about $\frac{1}{2}$ " total length seen. Black oak fully leafed out.

According to RCS Stoneman meadow only pond now seen to be dead. He asked Hubbard to try to save Govt. Center Pond from same fate. Uncertain as to how extensive practice is or how long it has been carried out in Valley. Seek specific information next ~~trip~~ trip to Valley. U.C. parasitologist indicated to Stebbins that toxins are added to oil in mosquito control.

May 13 Conversation with William L. Bill at Administration Bldg., Yosemite Valley, concerning mosquito control. Such a program has been carried out 4-5 years after mosquito problem became "almost unbearable". Areas affected are Tioga Meadows and Valley. Less oiling done lower sections of Valley but almost all standing water treated. Bill mentioned

L. Karlstrom
1954

Bufo boreas (23)

1/5 mi. S Govt. Center, 4000 ft., Yosemite Valley,
Mariposa Co., Calif., R. Stebbins took data.

May 8

week ending
May 8, 1954

① Air max-min. temp.: Max 85.0°F; Min. 32.0°F

10" above
ground.

Present reading: Max 78.0°F; Min. 80.0°F 1:45 p.m.
May 8, 1954 (DST)
(Reset with magnet) ✓

② Thermographs in tub. Replace charts: ✓

Thermo. 73.0°F } Pond (soil type) thermograph - red chart.
merc. 24.0°C }
23(?) air (air type) " - green " {

merc.

25.0°C
78.0°F

thermo.

check thermal element with quick-recording
thermometer and adjust if necessary.

Wind lock mechanisms ✓

add ink with dropper provided. ✓

③ Soil temperatures using new soil auger (near weather station) ✓

Surface (1") -

Time:

Soil just
under surface
black, wet
mud in
sun 19.5°C
2:05 p.m.
(Schuttke's)

{ 8 ft S } pool } Sat. soil.	6" depth -	13.2°C 2:07 p.m.
	12" " -	13.0°C 2:04 p.m.
	18" " -	12.5°C 2:00 p.m.
	24" " -	11.8°C - 1:50 p.m. (DST).

There is no max-min buried in soil at this
station. Suggest propping up lid on tub slightly
for greater air circulation around air thermograph.

④ Pond depth by measuring length of metal stake
pipe above the water. $4\frac{3}{4}$ above water.

⑤ Relative humidity reading. DB - 76.5°F

Time: 2:00 p.m. (DST)

WB - 64.0°F

(wind) → Air 1" above ground in shade near max-min. 25.3°C 2:08 p.m.
23.6°C (Schuttke's) - water / shallows - 2" deep
(bulb shade) but area in sun. (near tub) 2:07 p.m.

May 13 possibility that meadow near Bridalveil Falls may not have been oiled. He suggested that I contact the Sanitation Engineer (out of town for few days now) for more specific information. Snow to be plowed Monday on road to Gin Flat and Towerock Flat. He promises that keys will be available for chain gates this area.

Stoneman Meadow, 4000 ft., Yosemite Valley, Mariposa Co., Calif. The pools here have obviously been oiled. The odor rising from them is like creosote or camphor. The grasses along and in the pools are stained brown. In some parts the surface of the water (especially to the leeward of prevailing breezes in larger pools) is covered with a ^{light} brown scum. Pond A is such a pool. Apparently the NW breeze has forced most of the oil to the SE end. Living toads are not found within a radius of 5 ft of this 6x4' patch of oil scum. The Hyla and Bufo tad population appears to be reduced at least by $\frac{1}{2}$ at Pond A. I made about 6 sweeps with a dip net in different parts of the pond, sweeping along the bottom in water ranging from 2 to 8" depth. This sample should give a fair ratio of Hyla to Bufo which to me appears to be 10:1 or so. The Bufo toads appear to select shallow edges of the pond. One small area 1 ft. square,

L. Karlstrom
1954

Bufo boreas (25)

May 13 Stoneman meadow, 4000 ft., Yosemite Valley, Mariposa Co., Calif.

1-2" deep with dark brown sandy mud bottom had about 30 Bufo toads in it. No Hyla here. Water now appears clear of oil although grasses surrounding the small pool are oil-covered and dying or dead. Grasses out in deeper water have oil on them but are green and apparently surviving. Bufo toads collected here from spot described. Water temp 1" below surface 6" from pond edge; 12:58 P.M. (D.S.T.) 27°C . Air temp 1" above ground, bulb shaded, 27.5°C . Pond temp out in middle, depth 8", bulb 1" below surface 25.2°C . 1:04 P.M. (D.S.T.) There seems to be a definite Bufo preference for shallower water. They also tend to congregate on surfaces of light submerged objects or pieces of cardboard. These may be responses to O_2 tension or temp. (?) This noted before ponds were oiled, too. Small toads grazing on grass stems and bottom detritus. Algal development in Pond A is extremely weak. One Hyla adult on grass surface half immersed in water at 1:15 P.M. (D.S.T.) In full sun. This animal may have been under grass at edge of pond and moved out as I disturbed it. I saw 3 larger (1" long) Hyla toads eating one smaller dead Hyla. In this algae-poor pool the dead toads may be important source of food. I did not recover in my sweeps large numbers of dead toads, and I saw none on the

E. L. Karlstrom
1954

Bufo boreas (26)

May 13 Stoneman meadow, 4000 ft., Yosemite Valley, Mariposa Co., Calif.

pond surface. all evidence points to the fact that the oil now in and on Pond A is not lethal to the toads. A section of the oil sum at the SE end of the pond shows that Hyla toads are even underneath it at its edges although they are few in number. Water level in Pond A is down to original level (when I placed max-min. out April 9, 1954). Some of the smaller ponds are fast drying up. Hyla have been in pools not more than $1 \times 2 \times 1-2$ " deep located on a clay footpath. Pond B (long ditch paralleling footpath) shows much higher toad mortality. Oil forms scum over nearly all of pond surface. Few Bufo and Hyla present - sample taken. Water temp. 1" below surface 2' from edge 24.5°C . 1:40 P.M. (D.S.T.) Air temp 18" above grass (bulb shaded) 24.5°C .

Night check some locality. Found one D.O.R. toad on main road through meadow about 80 yards N by NE of Pond A. Dead at least 24 hours, probably longer. Appears to be ♂, large adult. 11:50 P.M. (D.S.) young ♀ adult found edge of footpath passing through SE meadow. Closest pool about 20 yards N of spot. Length (body) 67 mm. This animal has brighter ventral stripe than other 2 ♂♂ found East. Center meadow earlier tonight. Marked & released her (RF2 - sep data sheet) cloacal 10.2°C . Air 1" above wet grass in which animal found 9.5°C .

E.L. Karlstrom
1954

Bufo boreas (29)

May 13 1/5 mi. S. Govt. Center, Yosemite Valley. Night check this locality. 10:25 A.M. (D.S.) adult ♂♂ on crushed granite rock "road" cutting across meadow (smaller footpath E of wider former roadbed paralleling this one). Arrived 101 yards (my guess) from main ~~road~~ E-W road into S of Govt. Center. mottled white-gray granite rock surface. Cloacal 12.0°C , air 1" above roadbed 11.7°C . 14.2°C . just under granite sand some spot. / Time 10:50 P.M. (D.S.) Water temp. in pool $5' \times 4' \times 5''$ deep 15 yards E of study pond 14.0°C . Air $6''$ above it 13.2°C . Second adult toad ♂♂ found 61 yards from main Govt. Center road described above. This animal was on sandy-dirt hillside 1' high located 4' west of the crushed rock footpath. Cloacal 12.1°C . Air 10.8°C . Dirt (just under) 13.8°C . where toad sitting. Relatively inactive animal which remained in semi-flattened stance in dirt depression. Both adults above worked & released. Neither had a prominent, complete vertebral stripe but it was present. Color: cream.

May 14 Same locality. Indications are that this meadow has not been silted. The water level at the study pond is up (stage $4\frac{1}{4}''$ above surface). There is 2" of water now around the base of the tube. The tube is not in danger of flooding. Phenologically the meadow picture is this. The green meadow grasses now reach up 10-24" with the average height probably 16". Some

L. Karlstrom
1954

Bufo boreas (28)

May 14 $\frac{1}{2}$ mi. S Govt. Center, Yosemite Valley, Mariposa
Co. Calif.

of the sedges (?) go as high as 30" length but
stand suberect. Tallest grasses are in low pond areas,
as in middle of study pond. The willow-like bushes
described previously are to 10' height and partially
leafed-out, i. e. $\frac{1}{2}$ the buds have burst. Wild rose (?)
intermingling with the other plant in clumps is fully
leafed out. Oaks fully leafed out. Meadows in Valley
are almost fully green. Some acceleration in bloom of
filamentous algae. Hyla toads present in study pond
but not abundant. Sample taken. One Hyla egg
cluster (to resemble stage) seen in study pond.

10:00 A.M. Both thermographs working perfectly.
Calibrated with Shuttleworth's quick-recording thermometer.
Serviced them and left meadow.

May 22 Same locality as above. 8:55 P.M. Two adults, one ♂ and
other ♀, toads picked up in broken area ²⁰ yards
S of main road as I stood with friends awaiting the
"fabulous" Yosemite Firefall. Not marked since no equipment
along. Released right away. This higher, dry broken area
seems a favored toad spot.

May 23 night check at Govt. Center locality revealed ³
adult toads. Temperature data follows (see data sheets
for marked toads)

Specimen #3b, ♂ on dry sandy soil. Cloacal 12.5°C ,
air 12.5°C ; 11:05 P.M. #4b ♀ on edge of crushed
granite footpath, cloacal 10.5°C ; air 11.2°C . Time
11:27 P.M. #5b on dry sandy soil cloacal 11.0° ; air 9.5°C .

E. L. Kodatun
1954

Bufo boreas (29)

May 24 Stoneman mdr., 4000 ft., Yosemite Valley, Mariposa Co., Calif. Pond A now has dropped to low level, maximum depth 5" in middle. A 3-4 feet^{wide} brown ring of dead grass surrounds the pool, probably resulting largely from the oiling. New grass growth in the pond rises 14-16" above the water surface. The oil slick has disappeared but the remaining water is increasingly stagnant. The first 15 short sweeps with a hand dip net revealed Hyla toads only. It took me nearly $\frac{1}{2}$ hour to collect a 10 toad tadpole sample. As before, the Bufo toads seem to remain at the shallower pool margins. I picked up no toad toads in water over 4" deep. If my sweeps were at random 1 in 25 or 30 toads is a Bufo. Air temp. over lightly damp grass 14°C. at 7:45 P.M. (P.S.) Water 21.8°C. Pond A. Shallower pools in this meadow are practically all dried up and the toads are floundering in shallow $\frac{1}{2}$ " deep water. One such pool 5x3 yards long just E of pond A has less than a square foot of surface water. maximum depth < 1". Approximately 50 Hyla toads are floundering about; the most advanced are $\frac{3}{4}$ " body length and have hind limbs developed. The bottom of this pool is irregular yet no dead toads appear on the dried up parts of it. Original pond depth probably 5" maximum. Former similar shallow pond just north of pond A also down to few inches depth.

E. L. Karlstrom
1954

Bufo boreas (30)

May 24 Stoneman mdr., 4000 ft., Yosemite Valley, Mariposa Co., Calif. The ditch adjacent to the footpath SE of pond A shows similar effects of drying up. Higher ground now interrupts the ditch and a series of pools are left. maximum depth 4". Bufo toads are plentiful and appear 2-3 times as large as those gotten from pond A. Water temp. 8:05 P.M. (D.S.) 20.8°C. Bufo easily as plentiful as Hyla here. The oviducts are so concentrated that one short sweep of hand net could produce 50 toad and Hyla toads. 5 deer approached to within 20 feet of me as I sat taking notes. The presence of deer in nearly all the meadows must constitute some degree of hazard for adult toads and tree frogs, especially since the period that the deer browse and the toads emerge during the evening may nearly coincide.

May 25 1/5 mi. S of Govt. Center, Yosemite Valley, Mariposa Co., Calif. 12:10 P.M. I made a hurried check of study locality. max-min. readings taken and ~~toads~~ thermographs checked. Watch for temp. rise 12:30 P.M. due to sun on air thermograph. Instruments calibrated and checked out to ± 1 degree with Shultheis' quick recording thermometer. Two 3 foot long sweeps of bottom of study pool made and sample kept. Depth 10" where sweeps made. Hyla toads present but not in great numbers. Largest to hind limb stage. note toads in bottom sample. The meadow is one moss

L. Karlstrom
1954

Bulbo boreas (31)

May 25 $\frac{1}{5}$ mi. S of Govt. Center, 4000 ft., Yosemite Valley,
Mojave Co., Calif.

of tall green waving grasses, mostly sedge. Average grass height about 22" but many clumps reach up to 38-40" length and bend over in a procumbent position. Wind is moderately strong from the West.

The broom is reaching up to heights of 3 feet, average height 18". The western ozalea (willow-like bushes noted before) are starting to blossom. One 25' wide, 8' high clump 20 yards W x SW of my weather station had about 12 umbels burst out in partial to full bloom. This represents a fraction of 1% of potential blooms. Black oaks appear fully leafed out. Red-winged blackbirds calling from positions in yellow pines and ozaleas. Water level in pond same or lost time, ~~about~~ $4\frac{1}{2}$ " of stake above water surface. No signs of oiling having been done this meadow.

May 28 Stoneman Mdw., 4000 ft., Yosemite Valley. I briefly checked this meadow at 8:10 P.M. Tonight. Pond A is low, maximum depth 3-4 inches and pond area is $\frac{1}{3}$ of original I noted in April. As I approached the pool a robin was standing over a puddle 1-2" deep and apparently picking up the ticks flopping in numbers in the water. The ditch along the footpath is now a series of small (to 3' length) interrupted shallow (to 3") pools. Todd Ticks predominant

E.L. Karlstrom
1954

Bufo boreas (32)

- May 28 Stoneman meadow, 4000 ft., Yosemite Valley, Mojave Co., Calif. in these pools. 11:50 P.M. I returned and collected samples of tadpoles. One remnant of a pool in the former ditch paralleling the footpath water temp. 12.1°C. ; air 10.5°C. , 12:10 P.M. (D.S.) One small pool $2' \times 1' \times 2''$ deep contained \approx 500-800 toad larvae (few Hyla). I counted 40-50 dead at the middle margin. The pools in Pond A average 1" depth. Hundreds of tadpoles (nearly all Hyla) are congregated where there is water. meadow hazy from all the conifers. No breeze; grasses heavy with drops of dew. Weak Hyla chorusing. Constant traffic cars & people may inhibit them. P.M.
- May 29 Sentinel meadow, $\frac{1}{2}$ mi. S. East. Center. Air max-min 12:30 charts changed. 84-37° F.; present 50°. Soil max-min. 74-41° F. Present 52° F.
- June 3 Stoneman mdr., 4000 ft., Yos. Valley, Mojave Co., Calif. Pond A now almost completely dry. The total amount of water left in 3 shallow depressions would total less than $\frac{1}{2}$ gallon! Bottom of pool is still soggy with water bound in the soil. Toads present and floundering in each tiny depression. The largest $15" \times 8" \times 1"$ must have less than 25 toads, mostly Hyla. Bird droppings and the absence of dead toads over the bottom of the pool point to extensive avian predation, probably robins. Mosquitoes are thick. Time 7:05 P.M. all the water along pond B (the ditch paralleling the footpath) has dried up except for one small puddle $30" \times 16" \times 1\frac{1}{2}"$ deep. This is swarming with Bufo toads. Will collect sample tonight when night check made of this meadow.

E. L. Kaibum
1954

Bufo boreas (33)

June 3 Stoneman meadow, 4000 ft., Yoz. Valley

One adult ♀ taken 10:37 P.M. in grass edge of footpath 30 yds SW of 4-way corner SW of Stoneman Bridge. Cloacal 12.2°C . air 3" above ground 11.5°C . Temperature on ground (dead oak leaves) 12.5°C . Grass

leg to 16"
Sentinel meadow, 4000 ft.,

June 4 1/5 mi. S Govt. Center, Yosemite Valley. Checked weather

station 3:30 P.M. Both thermographs functioning well.

Pond level down now. The stake anchoring float is $5\frac{1}{4}"$ above pond surface. Air max-min $88^{\circ}-39^{\circ}\text{F}$.

Present reading 81°F . Soil max-min. $70^{\circ}-44^{\circ}$

Present 68°F . Soil still damp around base of the max-min. weather station box.

Soil temps 3:30 - 4:00 P.M. (D.S.)

surface - 23.9°C .

6" - 19.0°

12 - 17.5°

18 - 15.0

24 - 14.0°

The grasses now obscure view of my weather station from 40-50 feet away from it. maximum grass height something over 30". The ferns have shot up to heights over 3', average height about 30". The western azalea bushes are about 50% in full bloom, at least the one large bush 20 yards W of my study pond is that far along. Others about 30% (consequent lady beetles) bloomed out. yesterday and today the may bugs have been out by the thousands. The ferns around my

E. L. Karlstrom
1954

Bufo boreas (34)

June 4 1/5 mi. S Govt. Center, Yos. Valley.

Station have as many as 4-5 bugs on each upright branch. Sky clear with some cloudiness to the W. The day has been alternately cloudy and semi-clear. Relative humidity readings 4:15 P.M. in open sunny area above dry grass DB 79°; WB 62° F. Initial readings 81° F. monstrose mosquitoes out this afternoon. Wild rose has bloomed out (violet blossoms) since last vegetation check. This species acts a climber among rhododendron bushes E and SE of my study pond. I noted a few Dodecatheon plants in the meadow, these blooming and to 10" height. Algal growth seems restricted to a greenish-yellow growth matting near the edges of the pools. It is heavier than ever before but still covers less than 1/5 of pond surface. Lots of water in meadow. The supply seems unchanged over past 2 months. I made a quite thorough check of the ponds for eggs, covering area within 50-75 yards E & W of rock footpath. No took eggs. Bufo tadpoles larger and reduced in numbers. They swim and bury themselves in bottom ooze as you approach, making it difficult to catch them with a small dip net.

Stoneman meadow, Yos. Valley.

at 4:50 P.M. I made quick check here. The pool (B) along the footpath has been reduced 1/3 since yesterday. A robin was unmistakably preying on the congested toads (nearly all Bufo)

E.L. Karlstrom
1954

Bufo boreas (35)

- June 4 Stoneman meadow, 4000 ft, Yos. Valley
as I approached. The birds footprints were all around the wet mud at the edge of the puddle. I took a sample. On the north side of the road there is still a considerable flow of water along the main ditch thru the meadow, although many ponds are drying up. Hyla toads only seen.
- June 5 SW base of Wolf Dome, 6100 ft., Y.N.P., Mariposa Co., Calif
I hiked off the trail through a tangle of pine and riparian vegetation to check meadow nesting between mt. Broderick and Wolf Dome. The largest I encountered is 150 yards long x 125 yards wide. The sedges are to 18" height. It is almost impossible to get through or around the meadow. It is completely flooded with water to a maximum depth of probably 18" in the lower parts. The pine forest crowds in right at the water's edge. Along with lodgepole and yellow pine there is quaking aspen, western azalea and bracken. Horse dung indicates use of this as a pasture when it has dried out. No signs of any anurans. Thamnophis e. couchii seen at edge of meadow.
- June 9 Dentist meadow, $\frac{1}{5}$ mi. S Govt. Center. Snow fell last night following a day of almost constant rain. I checked the area for toads 8-8:45 P.M. last night. Vegetation soaking wet, ground saturated, and light drizzle falling. No toads seen. Today I photographed meadow at 8:30 A.M. (D.S.) #2 4x5" Plus-X taken looking W down canyon from crumpled rock

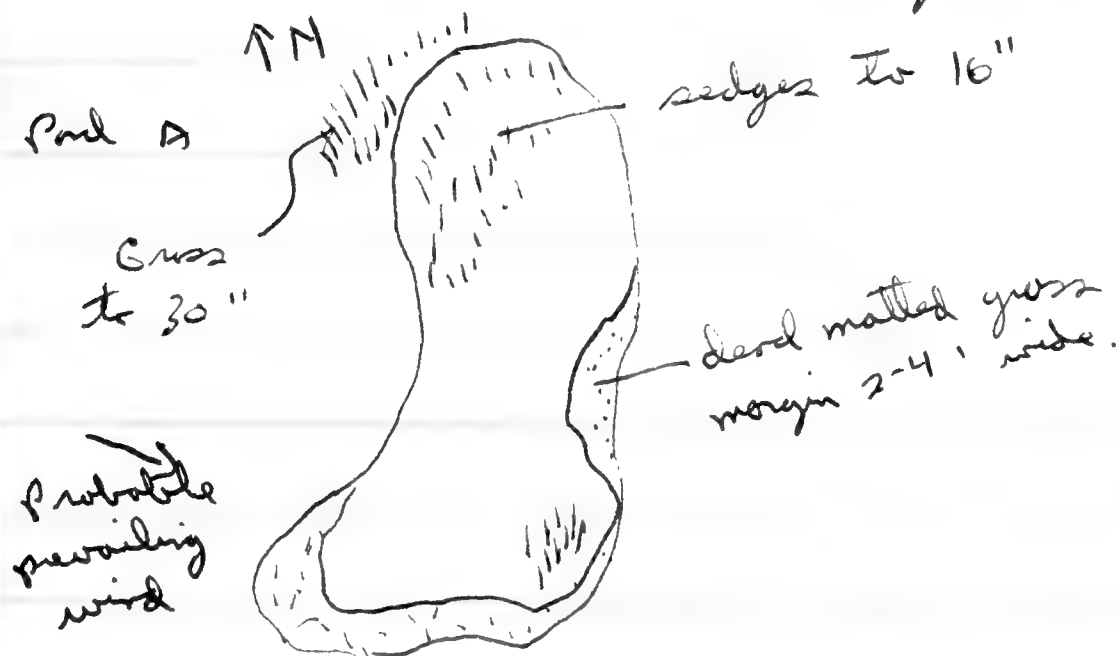
L. Karlstrom
1954

Bufo boreas (36)

June 9 Sentinel meadow, $\frac{1}{5}$ mi. S of Court. Center.

pathway. I forgot to pull the blank on #1. #3 photo taken facing E toward my weather station. Overcast with low clouds but some sun showing through. clouds cover walls of valley down to within 500 feet of valley floor. Slight drizzle began 9 A.M. Hyla silent but blackbirds active. Air max-min. $83-31^{\circ}$ F. Present air temp 46° F. Soil max-min. $71-39^{\circ}$ F. present 42° F. Reset both. Did not change thermograph dials at this time.

June 11 Stoneman meadow, 4000 ft., Yosemite Valley, Marysville Co., Calif. Clear, mild evening. no water at all in Pond A or adjacent pools, although bottom of pools soggy mud. not a tad seen. The birds are most efficient in cleaning them up. Grasses within the pool areas show retarded growth and $\frac{2}{3}$ rd of bottom area covered with dead matted grasses. The margins of the pools seem to have suffered most from the oiling, especially those margins where the wind had forced concentration of the oil.



E. L. Karlstrom
1954

Bufo boreas (37)

June 11 Stonerum meadow, Yos. Valley, Mariposa Co., Calif..
meadow grasses average 26" now. Western azalea
 $\frac{1}{2}$ bloomed out. Thimbleberry bushes show beginning
of berry development. Cow parsnips to 3' height.
Artemisia to 4' height. Air temp 7:55 P.M. (D.S.)
1" above ground 13.1°C . I found one remnant of a
pool on south sand side of the road, $16" \times 14" \times 1\frac{1}{2}"$
deep. About half dozen Hyla toads present. Hind
limb developed; body length $< 15\text{ mm}$. Water down
 $\frac{1}{3}$ in volume flow on north side of road, although
it is still slowly flowing in the ditch paralleling
road. Hyla only observed in ditch and one larger
 $\frac{2}{3}$ rd died up pool. Made check of El Capitan meadow
pond which now is $\frac{1}{2}$ former area and drying up
rapidly. Hyla toads only seen and but two adults
calling. Also made night check of verdant meadow E
side of Camp 9, just W of Indian Caves road.
much standing water, shallow & deeper (to 16") pools.
Grasses clumped and over 3' high, reeds to 8' height.
Two adult Hyla \rightarrow calling, Hyla toads present but
no signs of toads.

Sentinel meadow, $\frac{1}{5}\text{ mi. S Govt. Center}$. Night check
(through) made here. Two adult toads, \rightarrow ad &
recaptured & released. #3b \rightarrow dorsal 12.3°C ., air
1" above crushed granite path 12.0°C ., under granite sand
 13.4°C .; 9:45 P.M. (D.S.) #2b within 8 feet of #3b
dorsal 12.0°C ., air 11.8°C . 9:53 P.M. (D.S.) Both
on granite pathway about 75 yards S of road.

L. Karlstrom
1954

Bufo boreas (38)

June 12 Sentinel mdr., 4000 ft., $\frac{1}{5}$ mi. S Gov't. Center, Yos. Valley.

Max-min. $84-34^{\circ}$ F. at 4:10 P.M. (D.S.) Present
air reading 54° F. light drizzle falling. meadow
soaking wet after drizzle most of afternoon. Soil
max-min. $82-38^{\circ}$ F. Present 54° F. Charged charts
pond and air thermographs. Both operating well.
The pond level is about the same as last time with
 $4\frac{1}{2}$ " of stake above water. Phenologically the meadow
seems to have burst out even more due to rains
of this past week followed by a couple of fair
days. Ferns are to a maximum height of $4\frac{1}{2}$ feet,
average about 42". Scattered bristails to 10-12".
Western azalea still $\frac{1}{3}+$ blossomed out. Blackbirds
(red-winged) only birds active in area. Clouds by
4:45 P.M. lifting to tops of Valley rim at 6500-
7000 feet. no signs of adult toads or eggs. Hyla
toads in study pond about $\frac{3}{4}$ " body length, front &
hind legs developed, but I have not found any
toads here or elsewhere in the Park which have actually
emerged from the ponds. no Hyla or $\frac{1}{2}$ calling.

June 9 Letter of Ross F. Widy dated June 11, 1954 in which
he reports "came through hundreds of toads on the
road in the foothills [Pozemite all-Yan Hwy to
Mexico]. They got smashed by the tires but
they surely were on the road. Wonder about them.
I didn't stop for a sample, but could see them
hopping." Trip out made 8:15 - 1:10 A.M. Comp 19

L. Karlstrom
1954

Bufo boreas (39)

- June 9 to Berkeley June 9th. He reports hitting bad deluge of rain post^(w) monsoon. I wonder if tree-frogs not involved but very possibly B. boreas.
- June 12 Sentinel meadow, Yosemite Valley, 4000 ft., Mariposa Co., Calif.
night check made 9:15 - 10:30 P.M. (D.S.) Earlier about 8:30 P.M. I had found one medium-sized toad by a log campfire circle Camp 19. Afternoon rains should bring out toads over most of Valley floor where they exist. Camp 19 is located about 100+ yards S of Merced River along which some breeding pools may be found. No other toads discovered around the camp. I walked the paths to Sentinel Bridge and the meadow, then N along former road crossing meadow. One large adult ♀ (#56 see data sheet) encountered on bridle path 30 yds W of rocky footpath. She so full of insects appears sluggish. Cannot feel egg masses. May or may not be post-breeding ♀. Cloacal temp. 9.8°C ; air 9.5°C ; 9:37 P.M. (D.S.) Ground wet from afternoon downpour. No other toads found tonight. Hyla chorus very weak involving only a few individuals.
- June 14 Same locality as above. night check 11:00 - 11:45 P.M. (D.S.) of meadow area. Air temp 11:30 P.M. 14.6°C . 3" above ground. Moon casts soft glow, no breeze, mild. I cruised the bridle path, crushed rock footpath and through much of fern over S side of road without seeing one toad. at

L. Karlstrom
1954

Bufo boreas (40)

June 14 Sentinel meadow, Yosemite Valley, Marysville Co., Calif.

11:35 P.M. I walked along under street lamps lining walkway along road leading NE into Govt. Center. Then I cut through fern area SW of Ranger's Club. No toads. Ferns and grasses slightly damp with dew but ground otherwise quite dry.

June 15 Conversation with Assistant Naturalist Norm Verkerboom. He reports seeing adult toads around the employee's vegetable garden over by the residence area. Never more than one or two at a time, however.

June 21 Conversation with Chris Hauck, Sanitation Officer, Yosemite Valley. Stove oil only used with no additives. Order from Washington early 1940's that no DDT be used (Last year DDT used Tenaya Lake area, sprayed from planes, to control needle miners) Stove oil used straight and sprayed from 5-gallon tanks. Crude oil had been used until sometime 1930's (1935?) when it was objected ^{stove oil applied} to as being unsightly. Just enough to cover pond surface. Attempt to keep it off grass. This year at Stamenon meadow some got on grass. Oiling attempted only around valley areas of human concentration. At times can get down as far as Bridalveil meadow. 4-5 species mosquito in valley. Hauck has report on them. Sentinel meadow has been oiled, although I failed

L. Karlstrom
1954

Bufo boreas (41)

June 21 to see evidences of it during my checks. The crew could hardly get every puddle in that meadow. Houch reports that old-timers have observed pools with tadpoles but no wigglers (eaten by tods?). Contact Gray, Alameda Co. Mosquito Abatement District.

June 22 Sentinel meadow, Yos. Valley, Nevada Co., Calif. Check of weather station 8:20 A.M. Air max-min. 99-38° F. Present 68° F. Soil max-min. 81-42° F. Present 62° F. Weather clear and sunny but thermometer in partially shaded area this time of morning.

Surface - 19.8° C. Pond water level down. 8" of
6" - 17.5° C. stake above water, but moist
12" - 17.5° C. area around pond still saturated
18" - 17.00° C. Grass picture about same as last
24" - 16.50° C. report. Brocken higher, average
3½ feet but to 4½' max. Western azalea at
heights of bloom. Some sneezeweed blossomed out.
Blackbirds active. Bright sunny morning.

June 30 Same locality. Weather check made 4 P.M. (D.S.)
max-min air 98-46° F. 80° F.
" " soil 86-49° F. 73° F.

Charts changed in thermographs. Water level down about 5" from last check. The stake is 10½" above water surface. meadow grasses still higher, average 40-45". Brocken to 6'. Western azalea blossoms past their peak, about ½ are brownish & drying out. Hyla sample taken from study pond. Tods are close to emerging but some small Hyla Tods are present.

E.L. Karlstrom
1954

Bufo boreas

June 21 Chris P. Hauck, Sanitary Officer for Yosemite Park, provided me with a U.S. Public Health Service report on mosquitoes (and malaria control) in the Valley 1944. Report in Park Engineering file. Mosquito species listed by George E. Washburn. Those in greatest numbers:

Culiseta incidens (Theob.) - a meadow breeder

Aedes variegatus (Coq.) - tree hole breeder

Aedes vexans (mg.) - meadow and river pool breeder. Most controls directed against ^{Culiseta and} Aedes in Valley. All pest species. Survey showed no copheline mosquitoes in area.

L. Kalish
1954

Bufo boreas (42)

June 30 Sentinel meadow, 4000 ft., Yos. Valley, Mariposa Co., Calif.

It is apparent that the tall, dense meadow grass is unsuitable for movements of adult toads. Grass and brush is increasingly dense under scattered yellow pines S of study pond. I checked water running westward down middle of meadow. Sneezeweed now blossomed out and plants average 22", maximum 28". Blackbirds out and calling. Afternoon mild with moderate westerly breeze. A fairly extensive check of water over 2/3 rd. of entire meadow made. Hyla tadpoles only. Water level about same as in past weeks except in certain pools at edges of meadow where spring flow backing. It may yet be possible for toads to produce young in this meadow.

June 30
July +

~~toad~~ Large adult ♀♀ captured W of campfire site by children at Camp 14. Will be used for breeding with Tringa borealis. This toad under trees at least 100 yards from Merced River. Captured about 7:45 P.M.

July 1 Camp 14, 4050 ft., Yosemite Valley. Another adult ♀♀ collected back of stage 10:10 A.M. (D.S.). She appears vigorous. Evidence points to a general spread out population of toads in Valley. Paul Elkins, son of naturalist Sam Elkins, caught and later lost at Camp 19 a large adult ♀ near Merced River at Camp 6. This toad captured middle of last afternoon

L. Karlstun
1954

Bufo boreas (43)

Yosemite Valley, 4050 ft.

about June 25. a total of 3 subadult toads
June 23 have been taken at campfire circle Camp 19,
all in late evening hours. These appear to
have developed from same hatch since size
similar in each.

July 2 Govt. Center shops and Garage area. One adult
♂♂ collected along wall outdoor car ports
at 10:00 P.M. (D.S.) as I returned government
car after work. Evening clear and mild.

July 3 noted 3 toads today and one Hyla scavenging
on a single dead Hyla toad 11:00 A.M.
Previous to this I have only noted carnivorous
feeding by tree-frog toads. Algal supply placed
in aquarium 3 days ago has been eaten, so
that scavenging may be forced secondarily on the
toads. The toad toad ~~one~~ average body length
11.5 mm., total length 22 mm. Feeding toads were
near surface on top of a rock, water $\frac{1}{2}$ " deep.
The dead toad may have been dragged up from
the bottom to its position on the rock.

July

E. L. Karlstrom
1954

Bufo boreas (44)

Oiling Expt.

July 5 Laboratory oiling experiment. I placed 4 tadpoles and one metamorphosed Hyla in a refrigerator dish $4\frac{1}{2} \times 4\frac{1}{2} \times 3$ " filled with 600 cc. of fresh water. I gently poured 20 cc. of diesel oil over the surface. It coalesced into large droplets at first but immediately dispersed outward. The first 10 cc. covered only $\frac{2}{3}$ of the water surface, not extending toward the outer edges. But with 20 cc. of oil the entire surface became covered with a film. The two Bufo toads have hind legs 2-3 mm. long. Their total length averages 26 mm.; body length 12 mm. Hyla toads at different developmental stages. One lacks any limbs, body length $\frac{12}{23}$ mm.; second has 10 mm. long hind limbs, body length $\frac{13.5}{24}$ mm. Both have total length about 28 mm. The metamorphosed Hyla has almost completely resorbed its tail which juts out 2 mm. Body length 11 mm. It crawls up sides of dish readily in spite of oil film over its body. Oiling at 9:30 A.M. Toads active immediately and swim to surface in attempt to secure oxygen in the surface film. These animals are probably further along in development than those exposed to oil in natural pond near Yosemite Valley. Anoxia probably not severe by 10 A.M. The toads by swimming straight up from bottom (water $1\frac{1}{2}$ " deep) seem to break through film, at least an air

L. Karlstrom
1954

Bufo boreas (45)

oiling expt.

July 5 bubble may be formed. Usually, however, they work along edges of the dish, sometimes breaking film at the glass-air-oil interface. I blew gently down and across the oil film. The oil is readily forced to one side of the dish. The prevailing afternoon westerly winds in the valley undoubtedly (as noted at Stoneman meadow) force most oil to the leeward pond edges at least in larger ponds and puddles. The larger Hyla climbed out of the dish 4 times in 10 minutes. But after 10 o'clock it appeared unable to break through the film.

11:10 A.M. The metamorphosed Hyla immobile but last gular movements noted while frog on its back. Body covered with oil. The 4 toads still active and continue to work along upper edges.

12:15 P.M. One Bufo toad alive but belly up at bottom of dish. Others show decreased movements but still attempt to get on from surface. Symptoms of anoxia appear to be a definite contraction of melanophores, resulting in the lighter pigments showing through. This is most pronounced in the Bufo which begin to take on Hyla coloration. 2 P.M. all toads dead.

Karlstrom
1954

Bufo boreas (46)

July 7 Sentinel meadow, 4000 ft., Yosemite Valley, Marysville
Co., Calif. Night check here 11:00 P.M. Night
clear and cool. One ♂♂ toad found along
W edge of crushed ^{rock} footpath 80 yards S of
road. Active adult which moved right into
wet tall grass at edge of path. It moved
to damp mud edge of pool and remained secreted
among grass clumps. Checked toad LF 4. ~~Checked~~
~~temp.~~ 11:10 P.M. (D.S.) Air temp. 11.4°C .
1" above ground. No toads or signs seen
in pools (except for Hyla).

July 8 Same locality. Weather check 4:15 P.M. Air max-
min $88-45^{\circ}\text{F}$. Present temp. 83°F . Soil surface
max-min, $78-48^{\circ}\text{F}$. Present 76°F . About 16" of
stake above water surface. The float was resting
on clumped grass at one end. I moved stake and
float to deeper water. Hyla toads only in
pools observed. The clock mechanism for water temps.
did not run since last check made (Wed. before last)
though it had been wound up. I replaced chart
anyway. The water level all over the meadow is
down at least a few inches. However, running
water still flows westward under footpath. Grasses
are up to 4' in wet low places but average
near 40". Sneezeweed to 28" and blooming. Much
thistle development. Last Wednesday I noted
crew from Forestry Division spraying thistles with
2-4-D weed killer. Their activities probably have

E. L. Kulstern
1954

Bufo boreas (47)

July 8 Sentinel meadow, 4000 ft., Yosemite Valley.

little or no effect on amphibians in the meadow, since spraying is well controlled and directed only against thistles. Western azalea all but through blooming here. Clear sunny sky today. Strong westerly breeze - the kind of weather hastening evaporation of Sentinel meadow water.

July 18 Sentinel meadow, 4000 ft., Yosemite Valley, Calif.

all max-min. 99-47° F. Present 70°

Soil " " 80-50° F. " 74° at 7:15 P.M.

(D.S.) Clear, mild evening with no breeze. Pond water level down to 4" depth at stake. Float partially resting on mud pond bottom. Pool area now 14 x 10' or about $\frac{1}{6}$ of former size. Hyla toads in pond and none seen emergent from pools ^{here}. Sample taken. Thermograph charts changed. Air thermograph would seem to be registering too low maximum temps.

mosquitoes thick over meadow grasses. Vegetation about same height as before. Thistles heading up to blossom, to 3½' high. Brickellia blooming as is a 16" tall Ranunculus-like plant with clusters of small yellow blossoms. Cow parsnip border of meadow over 4' tall and starting to blossom. Western azalea blossoms dried up and brown. 6 female red-winged blackbirds seen perched on one dead azalea bush. I flushed 4 mallard hens out of the dense shallow ponds at middle of meadow. Most pools are dried up but

E.L. Karlstrom
1954

Buffer boreas (48)

July 18 Sentinel meadow, $\frac{1}{2}$ mile S Court. Center, 4000 ft.,
Yosemite Valley, Mojave Co., Calif. there still
is a slight flow of fresh water running W
along middle of meadow. algae (visible filamentous)
growth is reduced as pools dry up. The Hyla
are emerging now but ^{most} still possess tails. I
found 3 or 4 with but tiny tail stubs, body
length $\frac{1}{2}$ " +. The old road crossing N-S across
the meadow had dried up by last week. For
three days workmen have been spreading topsoil
over the old road-bed. Other meadow area left
untouched.

July 19 Bike check of various Valley possible breeding sites
made. Weather clear and warm, in high 80's mid-
afternoon. The area along road (Hwy. 41) below
Bridalveil Falls, 3920 ft. had some pools of
water along creek bottom only. No signs of
amphibians. Areas along S side of Merced River between
Bridalveil Falls and Old Village showed no standing
water. At base of large Boulder South side of
Village Church - pool dried up. Emerged Hyla only.
Indian Creek tributaries N of Lewis Hospital also
dried up. Loydel Moore, former naturalist now
working at museum, described pools this area
seen previous years. Many Sceloporus seen
on rocks and logs here 4:45:5:15 P.M.

check of Stevenson meadow, 4000 ft. on both sides
of road. No water left in meadow, and it is

E.L. Karlstrom
1954

Bufo boreas (49)

July 19 Stoneman meadow, 4000 ft., Yosemite Valley.

matted down due to pedestrian use and the constant foraging of deer here.

July 21 Sentinel meadow, 4000 ft., Yosemite Valley, Mariposa

Co., Calif. Night check of the meadow 10:45-11:15 P.M. (D.S.) Air temp. as noted thermometer

Government Center gauge area 74° F. at 10:15 P.M., but it was cooler in open meadow - possibly in high 60's. Not a call of any anuran heard, and I did not see a single toad. Weather clear with no breeze. After, a check of Stoneman meadow between 11:20-12:00 turned up same results. Amphibian activity in the Valley is practically nil, it seems, due to hot weather and early drying up of water sources.

July 24 Check made of Indian Run Spring, 1/4 mile E
of Indian Cove, 4050 ft., Yosemite Valley,

Mariposa Co., Calif. No amphibian toads of any kind in this highly mineralized spring. Flow still producing slow-moving rivulets up to 8 feet across. Heavy algal development.

Also check of meadows N side of Camp 9, 4000 ft., Yosemite Valley. No standing water left even in deepest (to 2½') potholes. Heavy high development of grasses, milkweed, rushes, and a woody bush-like plant to 4' high (composite?). This meadow would be one of

Karlstrom
1954

Bufo boreas (50)

July 24 N side of Camp 9, 4000 ft., Yosemite Valley,
Merced Co., Calif. — last to dry up since
it once had extensive deep holes of water. Hyla
toads apparently got out in time here. Day
hot and muggy.

July 28 50 yards NW of museum, Yosemite Valley, 4000 ft.
Merced Co., Calif. One adult toad found 8:10 AM
smashed by a car. Spot not far from SW corner
of wildflower garden where a small rivulet flows.
Day-time temperatures are in 90's at present.
Toads must be restricted to night-time food-
seeking and probably areas of moisture or
cover, e.g. near the museum garden and watered
cultivated area.

At 11:15 P.M. (D.S.) I made check of central
meadow, 1/5 mi. S Govt. Center. No toads
seen this area or under lights W of Govt.
Center. Temperatures in low 70's, no breeze.
Little water flowing thru the meadow.

E.L. Kolstun
1954

B. boreas (51)

August (?) Sentinel meadow, 4000 ft., 1/5 mi. S Court. Center,
(see chart) Yosemite Valley, Marysca Co., Calif.
Habitat shots taken with Voigtlander 4x5 camera,
Plus-x. Exposures 10, 11, 12 facing E from foot-
path. F11 or F12 at 1/100th. Bright, clear,
sunny day. 3:30 P.M. (D.S.). maximum-minimum
air 88-40° F. Present 80° F. Soil 77-45° F.
Present 66°. Pool completely dried up, but
bottom ooze still mucky. Deer tracks in
mud. High meadow grasses. Western bull thistle
in flower, to 5' height. Fern and milkweed
to 3 1/2-4'. Few cow parsnips to 2-3' and drying
up. Common monkey flower along footpath.
Oxygen air thermograph chart only.

EL Karlstrom
1954

Bufo boreas (52)

Sept. 15 Sentinel mdr., 4000 ft., Yos. Valley, Mariposa Co.
Calif.

First check of air thermograph and max-min. in valley station. Max-min., air, 92-32° F. Soil 80-35° F. meadow dried up except for morning dew on grasses. Grasses half-browned out here. maximum height about 4' but deer have matted much of it down. Western bull thistles still show blossoms in shady areas, but vegetative parts browned out either by poisons sprayed on them or natural fall processes. Buckhorn partly brown. Showy milkweed to 3½'; cow parsnip (seed already set) to 7' here. Some knotted to 3', already seeded. No water present this meadow as observed previous visit.

EL Karlstrom
1954

Bufo boreas (53)

Oct. 10 1.3 mi. N, 0.2 mi. W of Civic Center, Richmond,
Contra Costa Co., Calif. A quick check of this
dump area adjacent to S.F. tracks revealed no
toads. The pond(s) is dried up, but moisture
present under some flat-lying boards and auto
tires. Juvenal Taricha torosa and one Hyla
found in such situation. Soil surface temperature
under board 4:40 P.M. (D.S.) with bulb shaded
was 19.1°C . Air temperature foot above ground
(bulb shaded) 20.1°C . no standing water at
all. The tule growth includes plants > 7 feet
height. much of the tule and grass vegetation
is beaten down presumably by the small boy
living in a trailer court alongside the area.
Broken glass everywhere.

Oct 16 Storren meadow, 4000 ft., Yosemite Valley
Adult ♀♀ found by Dick Russell at edge of
camp parking lot SE side of meadow. One
slowly plodding over dry sandy soil edge of
pathway. Cloacal temp 5.2°C . at 9:55 P.M.
Ground surface 4.8°C . Air temp. 6" above
ground 6.2°C . Toad moved forward 10" when
disturbed and came to lie along edge of partially
buried retaining log.

Earlier in evening, 9 P.M. one adult and a subadult
collected in front of Ranger's Club, Yosemite Valley
Wardens, 4000 ft. cloacal 10.8°C . Air 14.2°C .
2' above ground. Oak leaf litter here over soil.

EL Karlstun
1954

Bufo boreas (54)

Oct. 17 Sentinel mdrw, $\frac{1}{5}$ mi. S of Court. Center, Yos. Valley
4000 ft., Mariposa Co., Calif.

Final max-min. for season air 92-26° C. Soil surface 79-27° C. Weather station cleared out except for cover to thermograph tube which I left in position. No water in meadow now. Western oaks reddish brown, leaves just beginning to fall. Black oaks just showing fall leaf change. Most $\frac{1}{4}$ th yellowed out, some at NW margin of meadow are overall greenish-yellow in appearance. Types of meadow grass (half matted due to deer & wind) all dried out but basal half of shoots still greenish. Crosses green back under broken beneath yellow pines. Western thistle and broken dry. Some dew this A.M. 9:00. Air temp 3" above ground 48° F. Sky shot with light straggly ~~straggles~~^{stratus} clouds except for high fog-like formations to east above and behind Half Dome. Sunshine bathes most of meadow 9:15 A.M. microtus active in bunched grasses. Steller Jays numerous oak border. 4 deer (does and young of year) stirred up this part of meadow. No toads ^{seen} in this area last night 10:30 - 11:00 P.M. Air temp 6" above ground was 8.5° C. Pathway across meadow paved as of early September.

ELK Station
1954

Bufo boreas (SS)

Oct. 17 Conversation over breakfast at Yosemite Lodge with Carl Stephens who worked summer at Ahwahnee Hotel and now is there and at Curry. Carl a undergrad herpetologist at Texas A & M. Dick Russell introduced him to me and vouches for Stephens' heavy experience.

Stephens uncovered a bufonid along a bank of a brook one mile above Nevada Falls in the Little Yosemite. He turned over a log at the edge of the bank. The Merced Lake trail here crosses the brook about 12 feet from the Merced River. He had worked up along the brook for a short distance. Time was a Thursday (day off) end of June, possibly June 24th.

This appears to be first report of toads in the Little Yosemite. Elevation at this reported locality, 6200 ft. If concolor is here it would be lowest record for species, and help to fill in the toad-less gap (4000 - 6500?) in region of Yosemite Valley.

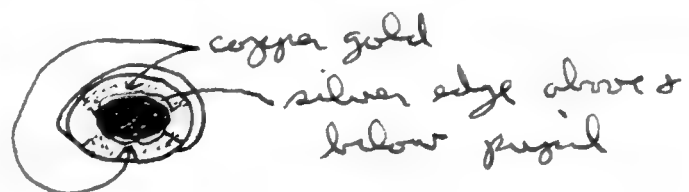
ELKarlstrom
1954

Bufo boreas (56)

Oct. 19 Color notes on boreas collected Yosemite Valley Oct. 16.

ELK # 388 subadult ♀?

Ground color a slate gray dorsally with the off shade white (bluish cast) underneath. no overall green dorsal appearance but there are small patches of Fern (I7) green - Mearns & Paul. around the black spots on back. Warts not heavily rust-tipped. Black runs into elongate blotches posterior-dorsally and on sides of body. Posterior mostly slate gray but blackish spots on side (green-flecked) and gray with some suffusion of rust-brown. Vertebral stripe discontinuous, not discernible until just posterior parotoids. A thin pencil line of off shade white to sacral hump. Vertebral stripe slightly raised up as an elevation of skin.



Venter with iridescent black blotches. Small 1 mm. spots scattered over throat.

ELK # 389 adult ♂

G.c. Olive drab Pt 15 13-5 M & P. with small black flecks thru it. Dorsal black spots and blotches. Parotoid light reddish brown (G-9 Pt. 14) as are tips of warts & tubercles. This ♂ less dorsal black blotching than ELK # 390. Vertebral stripe thin pencil line - cream colored and ~~about~~ distinct eye region to sacrum, but not rostral region. Venter grayish-white, little spotting, none on throat. Nuptial excrescences developed 1st & second digits.

ELKerlston
1954

Bufo boreas (SN)

Oct. 19 Color notes ELK #390 adult ♀♀.

G.c. slate gray but heavily marked with black or rust-tipped conical tubercles, each with dark tip. Black blotches on sides large & more extensive than ♂. The dorsal black blotches obscure vertebral stripe middle region of body. Stripe most distinct sacral region and just post. to parotoid glands. Parotoids ^{red} ~~light~~ brown 12E PL. 15 close. Venter similar to ♂ #389

Nov. 8 ELK #389, #390 B. boreas halophilus Yosemite Valley killed for skeletonizing. #390 showed new crop of eggs and follicles. Black eggs average 1.4 mm. diameter, gray-white follicles < 1 mm. No eggs in oviduct which is tightly coiled and flattened but not shrunken.

1.3 mi. N, 0.2 mi. W Civic Center, Richmond Contra Costa Co., Calif. This locality checked during driving rain 4:15 P.M. today. Heavy fall rains started night of Nov. 7 and continued most of today without letup. Even so, the ground was not soaked under larger pieces of wood and scrape metal cover. Dick Russell spotted two juvenile (yearling probably) toads which we collected from in and under rusty cans. Two juvenile Taricha also taken from under piece of plywood 2x2' square. Air temp. 16.8° at 4:20 P.M. No other herps seen.

Amphibians

Bufo canorus

E.L. Karlstrom
1954

Bufo canorus (1)

April 24 Yosemite Museum locality records:

48-52 Research Reserve, El. 8300 ft. Dry area near
Quadrat #3. D. Michener July 14, 1933.

Research Reserve, 8000 ft. "Reserve Bench" Yos.

95-96 Cr., W of Quadrat #6 A. Cameron July 12, 1934

710-713 Kerick mdr., 9300 ft. A. Cameron. July 29, 1934
(follow high locality records)

373 Horden Lake, 7575 ft., Involunte Cr. J.E. Cole
Aug. 12, 1939

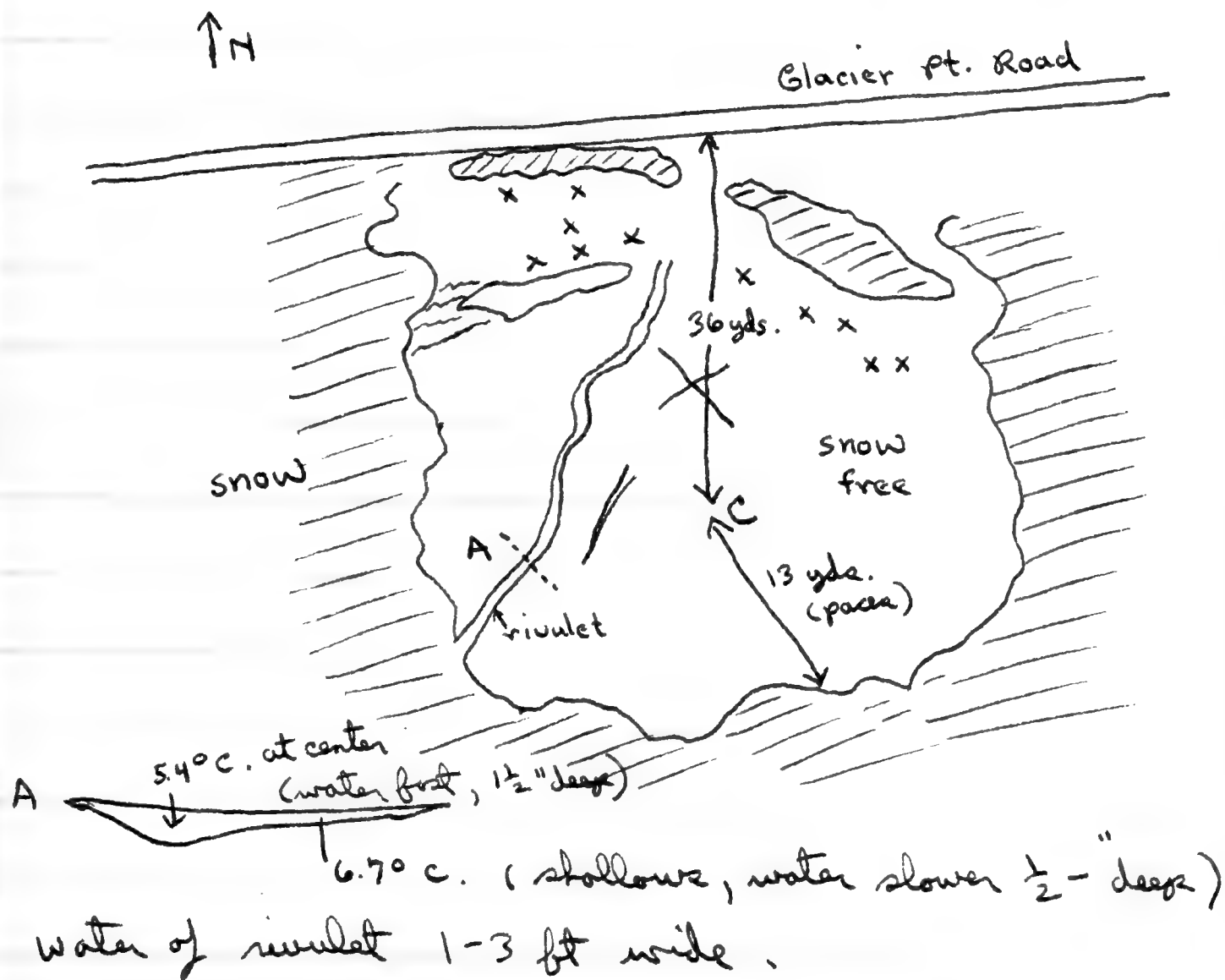
528 & 530 Turner's mdr., 7700 ft. S. Hansen, July 21, 1941

This list is incomplete. Only lower altitude localities
taken down.

E.L. Karlstrom
1954

Bufo conoue (2)

April 24 Peregrine meadow, 7300 ft., Yosemite Natl. Park, Mariposa Co., Calif. 1:07 P.M. Air 1" above moist dark brown soil fluctuates $11.0 - 12.4^{\circ}$ (bulb in area that had been in sun - now shaded by recorder). Soil saturated or near saturation point, easily squeezed from mass between fingers. Bulb just under soil surface in area in sun 17.4°C . The entire meadow to N and S of road snow covered except for scattered patches as below near side of road and elsewhere under the lodgepole pines.




B Water 6.7°C . 10" from edge of melting snow water 2" deep, in sun, much matted dead grass at another place at B water 5°C , 2" deep.

E.L. Karlstrom
1954

Bufo canorus (3)

April 24 Peregrine mdr. 7300 ft., Yos. Natl. Park, Mariposa Co., Calif.

rapidly flowing from snow bank across dead
grass mat. Some water upwelling from gopher
burrows. In dead grass layer 1-2" thick are
already a few green grass shoots and green
leaves (strawberry?). There is also a plant
with leaves subovate  and green. Stebbins
estimates snow off

this area but a few days at most. In one
new pool in full sun, quiet water, $1\frac{1}{2}$ " deep
at center, pool 3 ft. across, little seepage
in or out, water 9.3°C , 1:30 P.M.

Water of main stream, 150 ft. S of highway
 0°C . at edge of snow. Water here 6"-1 ft. deep,
fast flowing. Stream 8-10 ft wide, 2-6" deep,
10 ft. downstream and so in depth and width
for about 100 ft to next large snow deposit.
Water riffly and fast. Area in full sun.

Clump of moss in sun against fully illuminated
rock 13.4°C .

Willows along stream with buds but not bursting
yet. Willows 8" to 2 ft. high. Stream meanders
is 4-5 ft. wide 10"-12" deep 60 yards from
road.

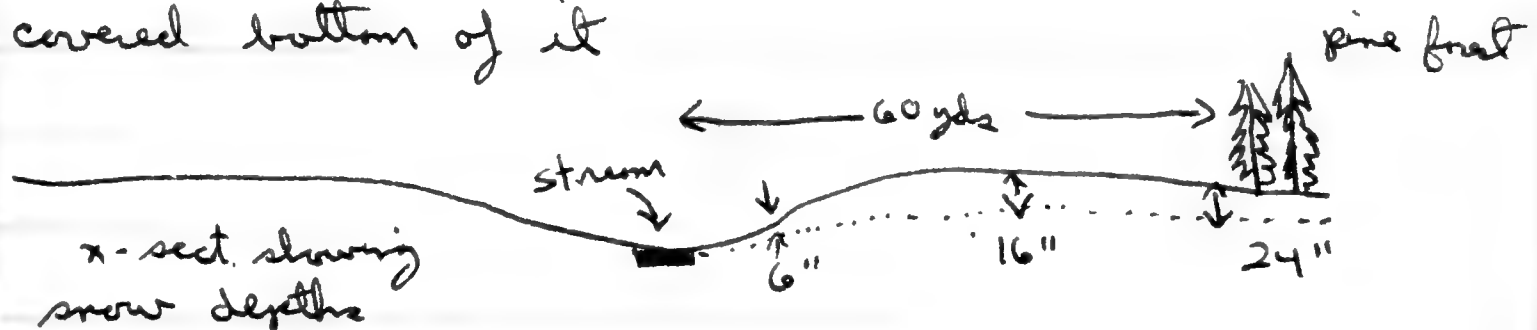
Soil temp. at C (see map)	12"	6.5
Temp. just under soil surface	18"	5.5
16.5°C . at 2:15 P.M.	24"	5.0

E. L. Karlstrom
1954

Bufo canorus (4)

April 24

Peregrine mtn., 7300 ft., Yos. Natl. Park, Mariposa Co.
Calif. Locality 6.9 road miles E of Chiquapin Ranger Stat.
Max-min. thermometer placed within weather station
box and left on bare ground near where
soil temps. taken. Also one max-min. thermometer
was buried in a horizontal position with the bulb
about 1" beneath the soil surface. Air temp.
(shaded bulb 2" above ground) at 2:45 P.M. was
11.5° C. Photos taken (9, 10, 11 on Plus-X roll)
First two facing N, last facing S by SE. Stebbins
also made photographs of the area. Plant samples
of first emerging forms collected (see previous notes
by Stebbins) the wet soft soil ^{surface} at this area
erupted by many fresh pocket gopher and mole diggings
Deadfall branches and trunk fragments of lodgepole pine
half buried in soft soil. Soil is saturated in
area C. Dug hole 12-16" deep; water quickly
covered bottom of it



April 30 Returned to same locality above. Fresh snow, 3-4" now covers most (2/3rds of area) of the uncovered soil surface noted April 25th. Air temp 1" above ground at 2:46 P.M. (D.S.T.) 1.2° C. Intermittent light snowfall and sunshine at this time. Moderate breeze.

E.L. Karlstun
1954

Bufo canorus (5)

April 30 Peregrine mdr., 7300 ft., Yosemite Natl. Park,
Mariposa Co., Calif

Max-min. reading now $22^{\circ}\text{F} - 61^{\circ}\text{F}$. Present
reading 41°F . This air temp with max-min.
thermometer bulb about 10" above ground. The
housing was upright and intact. Therm. reset 3:05 P.M.

Max-min. of thermometer buried in soil $32^{\circ} - 61^{\circ}\text{F}$.
I replaced it some general area but to W of
box.

Soil temps. 3:10 P.M. (D.S.T.)

Surface - $3\frac{1}{2}^{\circ}\text{C}$. (bulb just under soil surface)

6" - $1\frac{1}{2}^{\circ}\text{C}$.

12" - $2\frac{1}{2}^{\circ}\text{C}$.

18" - 2°C .

24" - $2\frac{1}{2}^{\circ}\text{C}$.

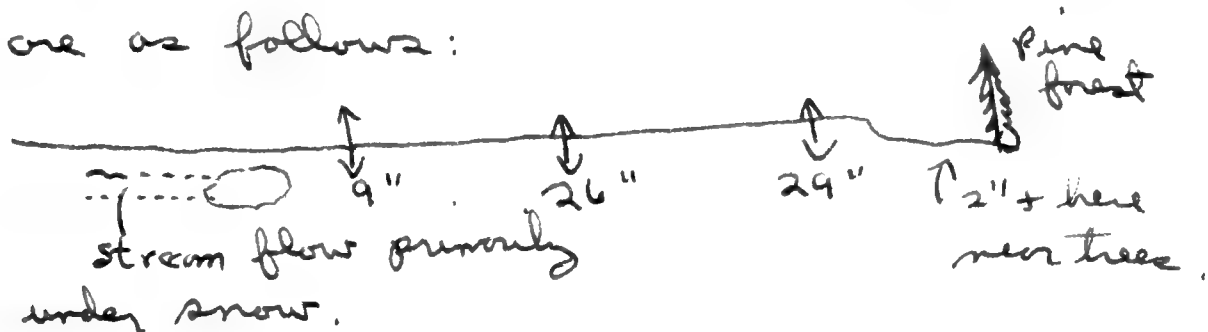
I set up Taylor air thermograph, Calibrated ³4:20
P.M. (D.S.T.) Present reading 40°F . Tub containing
instrument is buried 2" in snow and soil. Plyboard
cover ($\frac{1}{2}$ " thick) covers entire tub. Snow piled up 2"
around outside of tub for insulation.

Water temp. moving rivulet 12 feet W of weather
station 2.9°C . 3' wide, 1" deep. Snow to 5" along
margins. Larger main stream 2°C . Some icicles
where small part of stream cascades a foot down
over willow branches. Mt. chickadees in pine
trees calling. The snow has a glazed crust.

E.L. Karlstrom
1954

Bufo canorus (6)

April 30 Peregoz mdr., 7300 ft., Yosemite Natl. Park, Merced Co., Calif. Snow depths at transect made by Stalling's April 24 are as follows:



The ground is so soggy with water in areas where snow thin or off that I sunk into the black loam 2-3 inches. Additional runoff water is present spreading from the road culvert. It would appear that canorus emergence will be later as a result of the past week's storm. Ranger Sam Clarke at Chinquapin reported that Dodge Pass has 12 inches of recent snow. However, plows were working today to clear the road to Glacier Point preparatory to its opening for the public tomorrow. The recent snows have all been plowed off the road at least to Peregoz but certainly beyond.

E.L. Karlstrom
1954

Bufo canorus (?)

Perezoy meadow, 7300 ft., Yosemite National Park,
Mariposa Co., Calif. R. Stebbins recorded data.

May 9

note: Soil max-min. thermometer is buried 1-2" beneath soil about 15" W of weather station box. Dig it up first to avoid inadvertently walking over it. ✓

Week ending May 9, 1954

① Soil max-min. temp.: Max = 70°F; Min = 32.0°F

Time: 11:20 a.m. Present reading: (Reset)

② Air max-min. temp.: 39.0°F 11:25 a.m.

Min. 14.0°F

38.0°F 5.

Present reading

40° MAX 11:20 a.m.
40° MIN (Reset)

Week
ending
May 9,
1954

③ Air thermograph in tube

Replace with green chart. Prop up lid if possible

Wind clock ✓

Not running

Adjust stylus if necessary. Add ink ✓

④ Soil depth temps.

Surface - 6°C

6" - 6°C

12" - — missed

18" - 5°C

24" - 5°C 11:35

ruilet
4°C.

Sky overcast.

⑤ Relative humidity reading

DB - 37°C } raining
WB - 36°C }

Time:

⑥ Snow depth and extent if time permits. (I

can get NPS snow depth records from Perezoy)

meadows show
no green as yet.

Snow gone from meadow - few
scattered patches.

No eggs or toads seen. → Soil saturated - rain & snow
30 min. search in Melinda Stebbins

E. L. Karlstrom
1954

Bufo canorus (8)

May 13 Perego Meadow, 7300 ft., Yosemite Natl. Park, Mariposa Co., Calif.

Air Temp. 3:50 P.M. 70°F . Recorded max-min. readings for air and soil (see data sheet). The clock mechanism for the air thermograph not running. Suspect it was wound too tightly. Turned drum upside down and it seems to be ticking off perfectly. Took two photos with Valtander camera, Plus-X #11 looking N up meadow from road, P-X #12 facing NE toward weather station from across the meadow (same shot R. Stebbins took April 24th). The snow is completely off the lower major portion of the meadow. None under pines near weather station. Open higher ground in open shows first signs of drying out from saturated conditions noted previous trips. When a ball of surface soil pressed between fingers water squeezed out yet. However, firm footing in area just S of station. Gopher diggings (fresh) prominent. The open meadow is starting to green up. Prominent plant has plantain-like leaf 3-4 to a plant. Sample plants $\frac{1}{4}$ " - $1\frac{3}{4}$ " average coming up in small groups taken. Height of these about an inch. Relatively few clumps of green grasses to 3-4". Overall view of meadow is predominantly soil color. Temp. shallow moving rivulet 2' wide $1\frac{1}{2}$ " max. depth 20 feet W of station, in shade 10.7°C . 5:22 P.M. (D.S.T.) Air Temp. (shaded 1" above ground) same general location 15.3°C . Temp. main stream through the meadow at location



E.L. Kesteven
1954

Bufo canorus (a)

May 13 Peregon Meadow, 7300 ft., Yosemite Natl. Park,
Marysville Co., Calif

34 yards W of stream, 13.2° C. Water here tumbles
down low 1-3' cascades, is up to 8" deep. Soil
around stream area saturated. Temp. water running
over 20-30' wide area of ground, 1" deep, 11.4° C.

5:28 P.M. (D.S.T.). 5:45 P.M. Started the air
thermograph. Temp. calibrated 60° F. in the tub.

Pothole Meadow 7700 ft., Yosemite Natl. Park,
Marysville Co., Calif. This meadow 2.9 road miles
S of Glacier Point. Stream runs thru meadow. All
types of breeding water available for canorus -
still, shallow pools, rivulets, deep clear potholes (some
3' deep) etc. Hyla chorusing 7:30 P.M. (D.S.T.)
Water temp main stream 5.7° C. Air temp. 6.4° C
1" above ground. Scattered light high clouds. I found
one adult Rana boylei in a seepage pool 8' x 10' x
8" deep. Matted dead grasses in pool. Scattered
patches of snow over meadow - deeper banks to 2'
depth under pine stands. This meadow a good
month or more behind Valley meadows. No signs of
any anuran eggs although including Hyla pair
found at a pool's edge.

Peregon Meadow (mileage 940.7) 8:50 P.M. Moon
in 1/2+ phase casts soft glow over the meadow. The
sky is clear. Air temp. 3.2° C. 1" above wet grass
open part of meadow. 8:56 P.M. No breeze. Hyla
calling both sides of road. 9:05 P.M. I heard

E.L. Kalstun
1954


Bufo canorus (10)

May 13 Peregon mdr, 7300 ft., Yosemite Natl. Park, Marysville
Co., Calif.. what sounded like a canorus (bores-like)
→. Call sounds like a speeded-up Bufo boreas
series of notes, a medium pitched series of whistled
notes lasting about 6-8 seconds. Several minutes would
elapse between calls. I walked northward nearly to
the end of the meadow north of the road and after
the animal was silent about 10 minutes the call came
again from behind me. Careful stalking of the calls
finally brought me to within 10 yards of him. ~~at~~
The animal called about every 4 minutes as I stood
quietly zeroing in on its position. Adult ♂ in
open grassy area 30 yards E of pine stand, about
70 yards N of road and 20 yards W of main stream.
Surface water 2" deep here, level, open grassy area.
Scattered puddles of water broken up by grass
clumps and slightly higher ground. The grounds
thoroughly saturated in area. The animal's reaction to
my headlamp beam was to try to crawl beneath
short grass. Cloacal temp 10.40°C; 9:10 P.M. (D.S.)
Water in which animal 7/31/52 immersed 10.70°C. Air
1" above ground over damp grass 3.90°C. Brownish
coloration of toad's dorsum blended well with matted
dead brown grasses. This was only animal (canorus)
heard or seen over entire meadow N of road. A
check 200 yards S of road also made but no
other toads heard or seen. Very few Hyla calling.
Sound of feeding bats over meadow - clicking of jaws.

E.L. Karlstrom
1954

Bufo conense (11)

May 18 Color notes on ♂ adult collected May 13, 1954 at Peregray meadow. Toad dark brownish-green in field. Kept at 5-6° C. in MUZ bone room. Removed today and killed. Very dark brown when removed from dark room, then it began to lighten to present color. Color here from Moery & Paul.

ELK #181. Length 66 mm. Dorsal ground color I-1, plate 13 M & P., green with coat of yellow. Dorsal black spots are small, each < 1 mm width or diameter some run together in lines. Warts are smooth and relatively inconspicuous. Black flecks surround them in single or double row. Wart darker green-brown. Dark brown to gray coat  $\times 1\frac{1}{2}$ in center. over upper portion hind limbs and sacral hump. parotid gland & centers of warts L-8, Pl. 15 M & P. Venter off shade white. Black spots to 2 mm. width largest abdominal region and on upper jaw. Throat reticulate pattern of black on white, some underside pubic area.

Slight cornification and darkening of digits 1 & 2, tips of 3 & 4 forelimbs

Left testis: 7.5 x 3.4 mm. Rt. Testis: 8.1 x 3.3 mm.

→ Air 82-25° F; present 75°. Soil 73-32° F.
Soil temps. 0" - 24°, 6" - 11.1, 12" - 10°, 18" - 8.5°, 24" - 8.0°
May 23 Peregray mdr., 7300 ft., Yos. Natl. Park, Mojave 2:00 P.M.
Co., Calif. Quick check here of thermograph. Air thermograph not running but started again with shaking. Warm sunny afternoon, moderate breeze. No signs of toads. Night 11 P.M. Check here, too. No toads.

E. L. Karlstrom
1954

Bufo carorus (12)

May 25 Peregrine mdr., 7300 ft., Yosemite Natl. Park, Mariposa Co., Calif. Ploed water thermograph in tub and left in upper meadow 75 yards N of the road. Calibrated thermograph (Western Tag model) using my quick recording thermometer. Present temp. 1" below surface in very slowly moving 12" wide, 1½" deep rindlet 26.1° C. at 4:25 P.M. (D.S.) Describe site later. The air thermograph on S side of road is once again functioning. Watch fluctuation at 4:40 P.M. since I shifted point. Weather station now in cool, almost deep shade.

May 26 Kaiser Peak meadow, 8000 ft., 2½ mi. NW of Kaiser Pass Summit, Fresno Co., Calif.

Hydra chousing 4:45 P.M. from various shallow pools spread over the meadow. This meadow is large, about ¼ mile long and slightly less wide. Clumps of Salix to 14' height are scattered over it, while the surrounding stands of timber are lodgepole to about 80 feet in height. The swollen stream meanders through the length of the meadow which is ^{NW-SE} ~~SW-NE~~. The gentle gradient is to the ^{NW} ~~SW~~. All the snow is melted except for patches at the meadow edges. Shallow standing water forms large (1' to 50' diameter) pools at different points. Kodachrome slide #1 (F.35 at 1/50th) will show one large pool. Picture taken facing SW with Kaiser Peak in background. Water temp. in pool 50' across, max. depth 6" in middle, was 14° C. at 6:02 P.M.

E. L. Karlstrom
1954

Bufo canorus (13)

May 26 Kaiser Peak Meadows, 8000 ft., Fresno Co., Calif.

air temp. 1" above wet grass, bulb shaded, 12.4°C .
6:05 P.M. (D.S.) Water temp. taken 4' from pool's edge, 2" below pool's surface. meadow grasses average $1\frac{1}{2}$ inches tall with range 0-5". The overall meadow appears $\frac{1}{3}$ greened out. The Salix lacks leaves but catkins are burst and shedding pollen. Leaf buds have appeared. Water temp. 1" below surface of main stream, moving water, 6.20°C . at 6:23 P.M. (D.S.) Average width and depth of main stream is 16' wide, 15" deep. The banks are steep sided. The meadow is sandy loam. Trees and willows have been felled by the stream action. At the lower end (SW) of the meadow the stream cascades in many swift branches through the pine forest. Rodent burrows are numerous in the soft meadow soil. Grazing here is evidenced by numerous cattle pies. Robins and white-crowned sparrows seen in meadow. Rana boylei adults at ^{SW} end along stream. Hyla most concentrated SW side of meadow in potholes, melt pools and slow-moving surface rivulets. At 6:23 P.M. (D.S.) I came upon 2 Bufo canorus females in shallow run-off pool 30 yards from SW edge of meadow. Water 2" deep here. Both are remaining still 4' apart while I write. cloacal 14.2°C . , water where she sat 13.5°C . Air 1" above water 8.8°C . I now see eggs spread over the grassy slightly silty bottom about 2" from where the females

E.L. Karlstrom
1954

Bufo canorus (14)

May 26 Kaiser Peak meadows, 8000 ft., Fresno Co., Calif.
sat. The eggs are blackish, small (1+ mm.), uncleaved,
and spread out in strings over a bottom area of
about 9 x 7 inches.

Oh, the plot
thickens! One ♂ (the head thereof) sticks
out from under loose sod 6" from the egg
mass.



4 ft
← another ♀
and eggs
spread over
3 x 8" area

It seems very possible that the one ♂ has serviced
both females. I squeezed the ♀'s but got no more
egg extrusions. Cloacal temp second ♀ 14.0°C. ^{Water by her 12.5°C.} 6:35 P.M.

May 27 8:30 A.M. I killed and preserved both above
♀. They had been kept below freezing temperatures
during the night and were covered with ice this A.M.
Cloacal temp. both ♀ when removed from jar 0.0°C
But both showed righting reflex and one walked slowly
a few steps when prodded. Other animals also were
exposed to sub-zero temperatures. I had no max-min
thermometers with me but records of night-time temps.
I recorded with Schultheis quick recording thermometer
are these: Taken at mdw. 0.2 mi. N/W Kaiser Pass Summit

Air.	10:25 P.M.	(D.S.)	last night	over meadow	3.1°C.
"	10:50	"	"	"	1.5°C.
"	11:15	"	"	over dry ground	1.0°C.
"	7:15 A.M.	"	this A.M.	"	-2.0°C.
"	7:45	"	"	over meadow	-2.0°C.
"	7:58	"	"	"	+1.0°C.

E.L. Kesteven
1954

Bufo canorus (15)

May 27 0.2 mi. NW of Kaiser Pass Summit, El. 9200 ft.
Fresno Co., Calif. I had my animals in jars with water covering the bottom. This A.M. they were covered with ice, having been exposed to probable minimum temperatures of $-4-5$ degrees C. on top of the station wagon during the night. All animals survived including bullfrogs taken at about 5000 ft. The garter snakes collected near Shower Lake, El. , were apparently dead, but when I opened them up for preserving the hearts were still beating and I got a breathing reflex from one of them. One ♂ canorus had a cloacal reading of 0.4° C. at 8:15 A.M. (D.S.) Another had -0.3° C. (as best as can be read from 0-50° C. Skultze's thermometer) Both showed righting reflexes and one walked ploddingly for 8 inch distance over frozen ground.


May 26 same locality. I went out last night between 9:15 - 11:15 P.M. (D.S.) and just about froze trying to get close to calling canorus. The first sounds recorded on Tape Roll #1, 9:50 P.M. are of a ♂ adult food being answered by another male. This pair did not quiet as I approached. The ♂ on the bottom dragged the other over the soggy meadow for a distance of about 8 feet during the 15 minutes I observed. Air temp. 1" above wet grass 3.1° C. at 10:25 P.M. Water temp. in shallow ($\frac{1}{2}$ ") surface melt 4.0° C. I tried unsuccessfully to approach other calling ♂ in vicinity but they and Hyla

E.L. Korbstrom
1954

Bufo conarius (16)

May 26 0.2 mi. NW of Kaiser Pass Summit, Fresno Co., Calif.
are extremely sensitive to my presence or even the
sounds of trucks and cars a mile away. Finally
I set up the machine near where I had heard
and seen $\sigma^7/2$. Temp. data follows:

σ^7 conarius adult 70 feet W of lodgepole pine
border, body $1/2$ immersed in water. Water temp ($1/2$ "
deep) at 10:30 P.M. (D.S.) 3.8°C .

σ^7 basking on side of $3' \times 4" \times 3"$ piece of floating
log in pool 20' across and 4" deep. Water temp.
1 foot out from pool edge 10.4°C 2" below
surface. Couldn't get thermometer in for dorsal reading.
animal swam leisurely at surface across pool. No
use of forelimbs which remain at side while it swims.
I disturbed the  animal and it headed
back for other side of pool but this time it swam
more swiftly under water and buried itself half way
in silt of bottom.

σ^7 immersed half of body in $1/2$ " water. $\text{Cl. } 2.2^{\circ}\text{C}$.
Water 3.5°C . 10:50 P.M. Air 1" above water 1.5°C .
I saw no f toads or juveniles this evening. A total
of about 20 σ^7 seen and possibly a dozen heard.
I returned to the set-up recorder at 10:55 P.M.

B. conarius males had been calling from point 20-30 feet
from ridge. I approached from the woods, crouched
at recorder for at least 10 minutes but no calls. The
Hyla within 8-10 feet of me resumed their calls and
I recorded about 20 seconds of them, I was frozen by

E. L. Kerkut
1954

Bufo canorus (17)

May 26 0.2 mi NW Kaiser Pass Summit, Fresno Co., Calif.
this time so switched on my headlamp preparing
to pull stakes. There were 3 adult Bufo within
25 feet of me, one 4 feet from mine which was
placed 15' from me out toward the center of the
meadow.

May 27 Same locality as above. Frost over everything this A.M.
Temp. over frozen ground beside the car at 7:15 A.M. (D.S.)
 -2.0°C . No anurans calling from meadow. I had
breakfast and then went out to check the meadow. no
adult males out in open. Water frozen except where
its moving. $\frac{1}{4}$ " thick ice over still pools. I started
turning over logs. One adult \rightarrow under pine (?) log
located 25 yards W of pine forest margin. Buried
piece of log 4' x 4" x 8". The \rightarrow was $\frac{3}{4}$ the immersed
in a pool measuring 6' x 4' x 3" deep. Air temp. 7:45
A.M. 1" above frozen ^{grass} ~~ground~~ 6" from toad -2°C .
Shady here from 80' lodgepole pines to east. Sun
just filtering through. Ice $\frac{1}{4}$ " thick on ponds. Above
toad had cloacal temp. 1.8°C .; water in which it
sat, the ~~temp~~ same. Replaced log over toad (later check
at 1 P.M. showed this animal had moved out from
under log - may have been one I tape recorded calling.)
Temp. under another log 5' from where toad found
 4°C . 1" deep pool unfrozen water beneath log,
^{7:58}
~~8:15~~ A.M. (D.S.) I found one juvenile toad under
a curved rotted log 5' x 6" x 4". Log situated under
pine forest ^E edge of meadow. Shady here but 10%.

E.L. Karlstrom
1954

Bufo canorus (18)

May 27 0.2 mi. NW Kaiser Pass Summit, Fresno Co., Calif
filtering of sun's rays through pine canopy. Duggy
meadow soil under log. Temp. under log beneath
toad 2.4°C . Air temp. 1" above its position
 1.0°C . meadow surface frozen here. Toad could right
itself but otherwise did not respond to my prodding
it.

I returned to clean up my camp about 8:15
A.M. The canorus first started calling about
8:45 A.M. (D.S.) as the sun hit the meadow
surface. Calls were intermittent and not rapid
trills at first. I tried unsuccessfully to record
some of the first calls but the animals would cease
vocalization. Air temp. (bulb shaded) 1" above
ground 9:30 A.M. was 5°C . By 10:30 - 11:00
I was recording and did take air temp. until
11:15 A.M. at which time it was 11°C . over
large meadow grass.

The recorder was set in position about 45 feet
W of the edge of the lodgepole pines. I was
able to move the whole works forward as time
progressed. Sound of running water necessitated ~~placed~~
placing the mike lead on forked sticks. Some
interference caused by gusts of wind. Robins, mountain
chickadees, white-crowned sparrows, probably juncos
provide some background chatter from stand of
pines S of my position, where the forest projects
out into the meadow.

E. L. Karlstrom
1954

Bufo canorus (14)

May 27 0.2 mi. NW Kaiser Pass Summit, Fresno Co., Calif.
While I was recording 11:45 A.M. I saw a large adult toad climbing across a snow drift 45' x 10'. It took her about 2 minutes to cover the 40 feet, and it was comical to watch from my crouched position her body expanding and contracting in the pockets of the icy glazed surface. I caught her just as she plopped back into water. Her cloacal temp. 19°C ., surface of snow $3\frac{3}{4}^{\circ}\text{C}$. Water into which she had dropped and remained $\frac{1}{2}$ minute was 18°C . Apparently she had climbed out from pool at other end of snow patch. Temp there, also in about 3" water was 18.8°C . Earlier, about 11:30, I had seen an adult toad walk from shallow run-off pool to a deadfall $2\frac{1}{2}'$ thick log and move under its edge. Log buried 3-4" deep in meadow sumps. At 12 noon I checked spot where I had seen the toad. Numerous (8) depressions big enough to house adult toads were (had been formed?) along about 7 feet of this 35' long deadfall. Temp. in one "burrow" 5.8° at 12:05 P.M. Ah, now I see the head of a ♂. He lies in shade under log, can retract whole body as I move for him. Seems curious and comes out further. Cloacal temp. 9.1°C . depression 7.8°C . Such retreats would offer excellent night-time niches when meadow freezes. At 12:08 I drew a bead on calling toads (nothing disturbs them for long now!) My niche is set up 60' W of the NE pie first edge of the meadow, I

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1954

Bufo canorus (20)

May 27 0.2 mi. NE Kaiser Pass Summit, 9200 ft., Fresno Co., Calif.
was able to progressively move the mike forward toward
the toad which now is but five feet from it. ← H



A-B distance 30'

A-E " 40

A-F " 50'

A-C " 75'

A-D " 60'

A-I ~~30~~ 40 feet

} all approximate. Other toads calling
in distance, probably audible up
to couple hundred yards.

quiet
Hyla are apparently disturbed, local area here. Good!
It is relatively simple to induce a series of ^{canorus} calls
with a good low whistling trill. I've walked all
about these ponds and still they call. How
divine can these toads be? Water depth in pools
between snow rocks is up to 3"! nearly all toads
are sitting in pools. C was on rotted dead wood
for a short period 11:30 A.M. Last 1/3 of toge
(Roll #1) will be of this call setup. ~~all toads~~

E. L. Kadstrom
1954

Bufo canorus (21)

May 27 0.2 mi. NW Kaiser Pass, ^{9200ft} Fresno Co., Calif.

It. new water on appears 10 feet to my right as I sit crouched at the recorder. This individual (I) plus A and E seem to be the stars of a long (1½ mi) run. At its end I shouted Bufo canorus to indicate spot. Time 12:44 P.M. Wind picks up and interference noted. The mike lead is propped up along its length by forked sticks to keep it out of running (noisy) water. (I) is quiet this last run. A, D, & E seem to shine but A is still the star. He (A) moved 8 feet to the SW of the mike, facing other direction. (I) came in last 30 seconds of toge. I faded volume down toward end to give good background for closing commercial. Air temp 1:04 P.M. 1" above wet meadow 16.2°C. Toads still loud at it.

Cloacal temp (B) at 1:10 P.M. 24.4°C. 2" deep water in which it sat 23.1°C. Air temp. 2" above water where toad called 14.5°C. (bulb not shaded)

Cloacal temp. of animal near (C) position 25.4°C.

Air 1" above sappy ground 18.4°C. 1:15 P.M. The male stands almost vertical when calling as vociferously as toad A did. He seemed excited by the other calls (?) and would rear up give a call or a few series, and then walk forward a half foot and rear up again. The vocal sac is whitish, oval and bulges out a good ½ inch on a large ♂. 2:25 P.M. The canorus

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Bufo conerius (22)

May 29 0.2 mi. NW Kaiser Pass, 9200 ft.

are still calling. There is a definite triggering effect of one call on others. I approached one ♂ to within 4 feet. Its color phase is deep olive green-brown as is that



of other males seen. The whole body appears to quiver during the call. Body $\frac{1}{4}$ immersed in water. 2:40 P.M. Another ♂ seen walking over surface of a log 6' x 8' x 6". It plopped into nearby pool 8" deep Rana boylei style when I approached. This behavior noted many of the adult toads if a larger pool of water is available. Otherwise, they can hop quite rapidly (for a toad) clearing 6" of ground per leap.

The entire meadow area is a contrast in brown and white, snow covering $\frac{2}{3}$ of it, I ascended SE up to the upper parts, Tenax. main stream (snow all around it) 16.4° C. 2:50 P.M. No Rana seen and few Hyla adults calling. Mild sunny afternoon. A few Bufo can be heard calling intermittently from the upper part of the meadow. In a shallow (to 6") runoff pool 150' across I came on an adult ♀. Quiescent in 2" water, only eyes above surface. Cleared 18.9° C.; water same. Air above pool (shrub shaded) 12.5° C. ♀ ovigerous. Snow depth in meadow to 2½' maximum. Free of snow around borders and where the larger streams and runoff pools have formed.

E.L. Karlstrom
1954

Bufo canorus (23)

May 27 Kaiser Park meadows, 8000 ft., Fresno Co., Calif
4:00 P.M. One juvenile toad ($3\frac{1}{4}$ " long) found crawling
over drier surface of meadow. Surface temp. 17°C . This
is first young toad I've seen out in the open. Position
is 60 yds from nearest pine stand to the SW. A
second larger but juvenile toad collected, this one
20 yds from pine stand. Active on grass surface.
I scouted almost the whole meadow. Only other
eggs seen were seen to those gotten with ♀'s
yesterday. 2 separate bunches 3' apart. Both
had white clouded defunct eggs, about 60%
mortality. Eggs on bottom of shallow 2" deep
pool, grassy bottom, temp. of water 26°C . at
4:30 P.M. Too high afternoon temps. may have
killed eggs off (?)

May 28 En route Huntington Lake - Yosemite. In checking my
amphibians I noted that ♀ canorus adult had laid
30-40 eggs. Time 12:30 P.M. I placed these separately
in a vial of fresh stream water. Last night at 10:00
P.M. I checked Bodger Flats east of road leading
to Kaiser Pass Summit from Huntington Lake. Some
fairly level meadow-like areas here with melt-off
water to 3" depth. No signs of any canorus
vocal or actual.

Peregrine mdr., 7300 ft., Yosemite Natl. Park, ^{Monterey Co} Calif.
Checked weather station 2:00 P.M. Air thermometer
had run until yesterday A.M. I reset and left it
running. Air max-min. ^{Reset 65°F .} 70-24. Reset. Soil max-min.

E.L. Korbath
1954

Bubo canorus (24)

May 28 Peregrine meadow, 7300 ft., Yoz. Natl. Park.

roads 67-28. Present 63° F. Reset and replaced bath. mosquitoes are plaguing me here for the first time this spring. Soil temps. 0"-24°; 6"-11.5°C.; 12"-10°; 18"-8.5°; 24"-8.0°C. No snow patches visible south side of the road. meadow grasses average 4" range 2-8" small white wildflowers to 1" height. Ground around station moist but not saturated. moisture can be squeezed from it. More open parts of meadow S of road drier. Solid underfooting over most all of area except for stream margin. Water temp. 1" deep surface run-off 25 yards W of station 17.8°C. at 2:30 P.M. (D.S.) Temp. main rivulet 22.6°C. at spot previously recorded. Hazy sun, no ~~haze~~ breeze. Water thermometer upper meadow working well but may be recording 2° high. Calibrate end of week's run. Snow all melted except for tiny patches ice under the pines. Plenty runoff water upper meadow. adult B. canorus (3) seen but no eggs yet.

May 29 I checked meadows near Tonrock Flat Road junction with Triga Road (Hwy. 120), and on 2.8 road miles from Crane Flat Ranger Station. No tracks or eggs seen.

White Wolf mdr, 8400 ft., Yosemite Natl. Park, Mariposa Co., Calif. 12 noon. Blyla clousing. I chirped in my best canorus fashion and got a spluttering response from a male bird. He called but twice and after that I couldn't induce more calls, and didn't find the animal.

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Bufo communis (25)

May 29 White Wolf mdr., 8400 ft., Y.M.P., Mariposa Co., Calif.

This is not open meadow. Scattered lodgepole pines and dwarf willows (?) not budded out. Snow drifts cover $\frac{1}{4}$ of meadow area. Floor of meadow overall brownish color of dead grasses. New grass sparsely but to 4" some areas. Rana boylei ^(emersoni) adults and egg clusters. Most eggs encased. Air temp. (bulb shaded) 1" above dead meadow grass 14.8°C. at 12:44 P.M. Water in pool of running water 17.4°C.

Porcupine Flat, 7950 ft., Y.M.P., Mariposa Co., Calif.

No signs of crickets except a few Rana in the creek. Possible crickets area is down about 0.2 mi. E of Public campground. Porcupine Creek Campground another possibility. 8100 ft.


Snow Flat, 8700 ft., not checked but should be good locality. Snow depth here up to 2 feet.


Taraya Lake high with water. Turned on to Tuolumne meadows, 8600 ft. (See journal for additional notes on above sites) It would appear that cold night temps. are keeping toads down in areas above. Fairly extensive coverage made of good toad sites. Only male toad heard was at White Wolf meadow.

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1954

Bufo canorus (26)

May 30 Tuolumne Meadows, 8600 ft., Yosemite National Park,
Mariposa Co., Calif. Down SW of campground about
 $\frac{1}{2}$ mile. Air temp 8:01 P.M. (D.S.) 5.8°C . Water
temp. shallow (max 4") 75 feet wide pool 14.6°C .

Meadows free of snow but a few isolated patches
around campground under pine canopy. Rivers and
streams all high. The meadows appear less than
half greened out. New green grass averages 3" tall
but ranges to 5-6". Vast open meadows here cut
by many stream drainages. Lodgepole pine predominant
forest tree. Small composites (sample taken) to 5"
height  ← daisy like head. The melt-off water

 rosette of here ($1\frac{1}{2}$ miles SW of Tuolumne)
basal leaves. Camp forms large shallow

lakes up to 200 yards length. Choked meadow
just W of store at Tuolumne. Nothing there.

Kaiser Pass Ranger Station, 9950 ft., Tuolumne Co., Calif.
Locality just W of Ranger Station still $\frac{1}{4}$ covered
by snow to 2' thick. Meadows further W along
Road even more snow, $\frac{1}{3}$ covered. Hyla (few) calling
but many from under grass. Air temp 1" above
dense grass 1.5°C . at 8:55 P.M. Water temp in
 $1\frac{1}{2}$ " deep runoff 3.1°C . I listened for long
period and called canorus style. No crickets heard
or picked up with herdman. Grasses just starting
to grow, less than 1" tall. Apparently this
area as well as Tuolumne not right now for
Bufo emergence. But why at Kaiser Pass under

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1954

Bufo canorus (27)

May 30 what appears to be similar environmental conditions?

June 1 2 miles W of Sierra Pass Summit, 8900 ft., Tuolumne Co., Calif. 3 P.M. (D.S.) most of area described by Joe Gorman as toad habitat is under snow. (See Journal for slides taken of area). The dwarf willow growth, however is free of it, and seep water runs thru the lower areas. The 40° and steeper canyon slope to the S and SE has a full pack of snow probably drifted up to 4' thickness, although a few higher spots are bare. Patches of snow are left up under the lodgepole pines to the E. The stream is very high and bordered by thick snow accumulations. Air temp. 3:32 P.M., bulb shaded, up under scattered pines over bare, dry ground 13.2° C. The wind approaches gale velocity most of the time. It has already torn a sheet from my notebook. Wildflowers on slopes here to 3-4". The dwarfed willow is just commencing to burst its buds.

June 3 mono(?) meadow, 7100 ft., Y.M.P., Mariposa Co., Calif. 8 P.M. Evening check of at least part of this meadow (1.5 miles E of Peregoy). Plenty of surface melt water covering a third of this elongated (200 yards x 75 yards) section. Slow deep creek runs thru it. Grasses to 8". Dodecatheon in bloom, 6" tall. One Rana collected. No amphibian calls of any kind, yet this appears to be favorable Uta and Bufo habitat. mt. chickadees and several juncos heard in pine woods.

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1954

Bufo coronatus (28)

June 3 Peregon meadow, 7300 ft., Y. N. P., Mariposa Co., Calif
Arrived here 8:40 P.M. (D.S.) Last evening glow at
this time. Hyla audible from far northern end of
meadow N of road. I sat in the car with windows
open. 8:50 P.M. a single tree frog started calling
30 yards N of the road. more joined in. I waited
in the car a full 15 minutes before starting a
night check of the meadow north of the road.
Air temp. 1" above dense grass 7.1°C . at
9:27 P.M. Water temp. main rivulet 10.3°C .
Water temp. surface run-off 12°C . meadow very
wet, about $\frac{1}{4}$ of its surface has melt-off water
covering it to 1" depth. I made a thorough
headlong check in soggy areas bordering both sides
of the rivulet. Three Hyla and two Rana seen.
not a sign of toads.

June 4 Same locality. Max-min (air) $71-22^{\circ}\text{F}$. Present 52°
Soil surface max-min. $70-23^{\circ}\text{F}$. Present 49°F .
Changed air thermograph chnt. Grass in meadow south
side of road averages 6", maximum height to 11".
Grass itself is sparse, tends to occur in patches.
Ground is moist but not soggy. Rain or light snow
probably fell last night or night before. 5:45 P.M.
no sign of toads or eggs either side of road. Hyla
not calling. the constant Sunday car traffic may inhibit
the tree frogs. Dodecatheon blooming, to 5" tall.
Plantain-like plant widespread, leaves 5-6" long. A
yellow buttercup out, 2-3" high. Cloudy sky, cool.

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1954

Bufo corvus (29)

June 12 Peregon meadow, 7300 feet, Yosemite Natl. Park, Marysville
Co., Calif. air max-min 6:45 P.M. (D.S.) 60-21° F.
present temp 41° F. Soil max-min 59-27°; present
42° F. Ford thermograph working well, but Taylor air
thermograph again stopped after but about 16 hours
operation from last setting. Will bring it down to
Valley for cleaning. Meadow saturated now after
driving rain of this afternoon. Shallow (to 2") pools
everywhere in meadow at low spots. Creek high. Temp.
running water 8.6°C. at 6:52 P.M. (D.S.) Robins,
Brewer's blackbird, *Scirpa juncos* active in meadow.
Stellar's jay, mountain chickadee^{or} heard in lodgepole
pines. Patches of blue sky by 7 P.M.

June 18 Meadow SE side Tioga Pass Ranger Station, 9900 ft.
Tuolumne Co., Calif. 1:15 P.M. Check note of this
toad locality bright sunny afternoon. Westerly wind strong.
Air temp. 1" above meadow grasses 19.1°C at 1:21 P.M.
male toads heard calling from vicinity of ponds 150
yards SE of Park Entrance. Bob House, Ranger at
the Tioga Station, has been on duty a week
and reports the trilling of toads ^(probably tree-frogs EVK) since he came.
Droved 8 inches last Wednesday. melted within
a day. 4 inches snow on Friday but melted
off by noon. Rain at Tuolumne meadows
instead of snow but snow at Snow Flat region
where drains were required. 1:55 P.M. I walked over
about 200 yards SE of Station. Small lake here
running N and S, crescent-shaped 120 yards x 75 yards.

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1954

Bufo caninus (30)

June 18 200 yds SE Tioga Pass Ranger Station, 9920 ft., Tuolumne Co., Calif. Lake drops off to $2\frac{1}{2}$ ' depth on W side. matted brown grasses right to edge and shot through underneath with mice (microtus?) burrows. Two juvenile toads taken here, one immediately took cover beneath matted cover as I approached it. mossy, soggy mat beneath meadow grasses along lake edge. Adult ♀ seen right at edge of lake. 2:05 P.M. (D.S.) In full sunlight but half submerged in water. Resting on surface of grass clumps. cloacal temp. 23.5°C . water temp. $\frac{3}{4}$ " deep where she rested 18.6°C . Air temp. 2" above water (bulb not shaded) 24.5°C . Air (bulb shaded) 17.8°C . no males calling at this pond now but one Hyala heard. Started up trail to Gaylor Lake 2:55 P.M. adult and juvenile toads along path. ♀ adult cloacal temp. 28.0°C , air 1" above ground 17.8°C . at 3:07 P.M. some seep water along trail, scattered small snow patches occasionally. Bright sun, clear sky. nearest pond possibly 100 yards SE on N side of road.

Gaylor Lake, 10,300 ft. One medium-sized toad found at edge of stream leading from area of upper Gaylor Lake to one of Granite Lakes (most westerly one) < 2-3 inches of ice left on middle Gaylor Lake, thawed out only at some edges. Widy, open grassy country, stream with boulders. Other lakes thawed but probably ice up cold night. the westerly Granite Lake has level marshy areas especially north side. Hyala heard calling.

E. L. Kalish
1954

Bufo canorus (311)

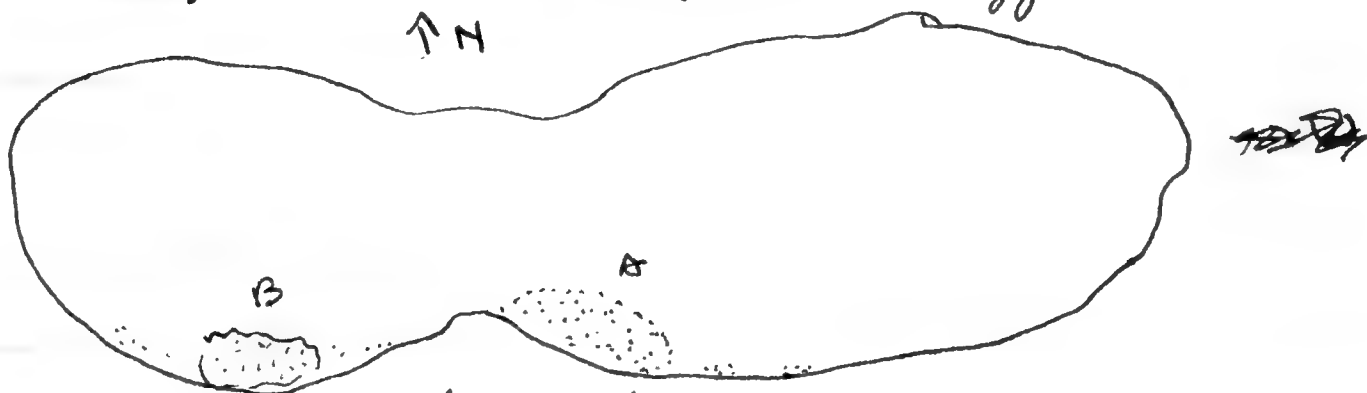
June 18 200 yards E Tioga Pass Ranger Station, 9900 ft.,
Yosemite National Park, Tulare Co., Calif. Recordings
attempted at deepest of lakes in area. 9:15 P.M.
(D.S.) This is sure pond I collected female and young
toads by this afternoon. Two ♂ canorus heard
calling, one on E and one on W side of lake. First
^(Toad #2)
 $1\frac{1}{2}$ (?) minutes of Hyla with toad coming in from
50 yards across lake. Neither toad trilled from 9:15-
10:15 P.M. but gave sporadic long series of notes,
each series lasting 8-13 seconds. I would estimate
about 3 notes per second. Temp. 10:08 P.M. 2"
above dam, dead grass -0.1°C . Water temp
at edge of lake where $1\frac{1}{2}'$ deep, 2" below surface
 15°C . I could not get close to either male toad.
They cease calling when I get within 10-20 yards
of them. My mimicking them may start them
calling but not consistently. No young or female
toads seen during check $\frac{2}{3}$ way around
edge of lake. First toad actually seen 10:25 P.M.
at edge of rather large pond about 150 yards SE
Station. In shallow water, a depression in sod
14" from deeper (14") water of pond. Cloacal 12.6°C .
Water 9.8°C . Suspect toad heated up by my
hand during taking of temperature. I had heard
one adult ♂ a half hour earlier from this vicinity.
Toad calls come through well only when Hyla cease
up. Air temp 3.8°C at this pond edge. Ended
night check 10:50 P.M.

E. L. Karlstrom
1954

Bufo curvus (32)

June 18 2.4 road miles E of Tuolumne meadows, ft.
Tuolumne Co., Calif. 10:55 P.M. I found one
medium-sized ♀ on road. Choral temp. 11.1°C.
Surface of road 12.5°C. Air temp 6" above pavement
5.3°C. Night clear. 2/3 rd full moon coming up
and casting glow over Tuolumne meadows as I
returned to camp.

June 19 200 yards NE of Targa Base Ranger Station, 9900 ft.
Y.N.P., Mono Co., Calif. Light very high clouds but
burning off under bright sun. Air temp. 14.4°C.
1" above wet marshy area (bulb shaded) 9:58 A.M. (D.S.)
I send Dyla off in distant large ponds. Two more curvus
from this site. Low marshy area here with rivulets
running through it. Vegetation dwarf willow and
meadow grasses. One pool 40 x 15 yards x maximum
of 5" deep had tad tadpoles and eggs in it.

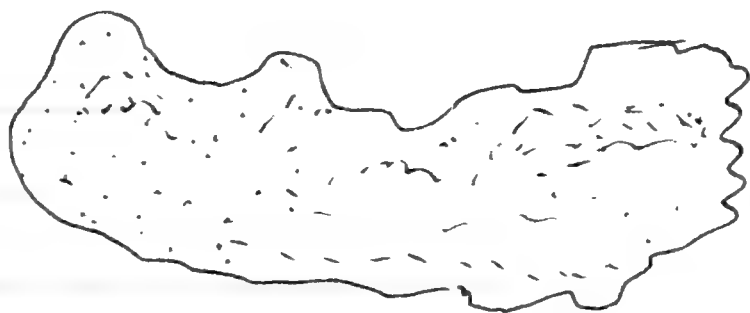


Tods to total length about $\frac{1}{2}$ ", very blackish. They
are restricted to one area 8 x 4 feet with but a few
pockets of tods outside this area. Water temp. 1" below
surface where tods and eggs present 15.5°C. at 10:06 A.M.
Water depth < 2 inches where tods congregated. Bottom
silty, and unhatched eggs covered over with it. Grasses
in marshy pool to 10" high, greenish below but most
brownish at tips. Grasses on bordering higher ground

E.L. Karlstrom
1954

Bufo canorus (33)

June 19 200 yards NE Tioga Pass Ranger Station, Mono Co., Calif.
to 3" height but average 2" and $\frac{1}{3}$ greened out. at
10:12 I heard adult toad 40 yards to SW of my position
on N side of pond. It gave but one trill lasting about
9 seconds. Other $\approx \frac{1}{2}$ heard from large deeper pond to
NE of me 100 yards. Will set up recorder edge of
this pond. Fairly open stands of lodgepole pine
border this section of meadow area. Distance between
forest 80 yards across the pond described. Snow banks
on north facing 25° sloping hillocks are to $1\frac{1}{2}'$
maximum thickness. They are scattered and maximum
size 40 yards long x 20 wide. By 10:35 I heard
at least 5 male toads calling within 100 yards of
my position near the pond. Recording made 10:45 A.M.
(D.S.) I had to induce calling by a toad about
25 feet from mine. He breaks in first minutes
of toad due to my switching machine to "play"
position, giving a call, and then toad response by
toad. Temp. 11:10 A.M. 1" above meadow, bulb
shaded, 20.9°C . Toad now calling from middle of
pond described. Recorder set up S side of meadow
near snow banks a minute. Eggs at B position seem
to be strung out over 3 foot area right up to edge
of pond. Estimate



$\frac{1}{3}$ toads hatched out.
"Eggs" in late nucleus
& tail end stages mainly.

$\frac{1}{10}$ of undeveloped (unhatched) eggs are apparently defunct,

E.L. Karlstrom
1954

Bufo conurus (34)

June 19 NE side Tioga Pass Ranger Station, Mono Co., Calif.

serve with green algal growth. It is apparent that toads at this early stage tend to remain in area where eggs were laid. Two sites of egg deposition are 20 feet apart and could represent two females. Few scattered toads between sites of egg deposition. Water temp. where eggs laid (in full sun) 26°C . at 11:25 A.M. and must reach 30° at least by afternoon. 11:40 A.M. I recorded calls from S edge of meadow. Slowly moving seep water here to 1" depth. No less than 5 males within 20 yds of my position



Crosses to 8-10 inches, brown.

(B+C)

He took B+C love repeatedly tried anplexus, in spite of release notes given - a softer trill. or on toge often gives loud

full trill. They quite violently reversed positions once. now at 11:54 A.M. The two are 3 feet in front of me in ~~ped~~ pectol anplexus position. Lower keeps walking forward, escapes, and by 10 inch leaps the aggressor again climbs on him. They separate and top toad immediately starts calling in series with A & D. Then the one of B+C combination finds F and continues anplexus with similar results. I

E.L. Karlstrom
1954

Bufo conarius (35)

June 19 NE side Tioga Pass Ranger Station, Mono Co., Calif.
now see eggs on bottom, mostly hidden by silt, where
B & C had been. Water depth less than 1", average $\frac{1}{2}$ ".
Eggs to tail bud stage, none hatched into tadpoles.
These live margin of the shallows, and are spread
no more than 2-3 deep over area 4 feet x 12 inches.
Water temp here 12:03 P.M. (D.S.) 23.5°C. in full
sun. Air temp some time 3" over dense grass 18.8°C.
(bulb shaded) Spacing of the adult $\approx \frac{1}{2}$ averages about
25 feet though, as mentioned, they do come right in
contact. As I now write, A is in same position
as before, E is 8 feet from end of mine and
either C or D is 10 feet east of E. Repeatedly

↑ N

A has been triggered

(E)

by took further off
and has started E,
C joining in right after.
Sequence may be reversed.

(P)

Point is that one (C) will act as definite stimulus to
others. Same situation as at Kaiser Pass. I was 2 feet
from (C) taking these notes. If I stood up he stopped
calling. 12:14 P.M. Another $\approx \frac{1}{2}$ complex involving
(A) and other toad which apparently was in area and
I overlooked. Short booms-like notes are given, 3 or 4
at a time, as release notes. At 12:15 I ^{collected} ~~marked~~
notes in area. They are harder to see since as I walk
near many of them bury themselves in the silt of the
pond bottoms. At 12:42 P.M. I came on a shallow

E.L. Karlstrom
1954

Bufo canorus (36)

June 19 NE side of Tioga Pass Ranger Station, Mono Co., Calif.

pool area 20 yds SW of deadfall at N margin of my study area. Shallow, to 2" depth, with scattered reeds to 6" height. One ♂ & one ♀ amphibia pair here and no less than 5 other males within area 10 feet square. Water temp. where pair lies $22\frac{1}{2}^{\circ}$ in sun at 12:45 P.M. (D.S.) Pair collected and separated. Other males collected same puddle. Mud oozy here, and toads crawl themselves in it. I made checks around other meadow ponds and potholes. One shallow (to 4") pool had toad toads developed out and active. Water temp. 32° C. 1:15 P.M. Toads same size as those collected earlier today.

June 21 Penguy Meadow, 7300 ft., Y.N.P., Mono Co., Calif.

4:15 P.M. (D.S.) I closed chart on water thermograph. No air thermograph in operation. Not sunny afternoon. The upper meadow area grasses green to greenish-yellow, average height 5", range 3-10. Dodecatheon now ⁶⁻⁸ 8" tall; Ranunculus also blooming and 4" high. Near shady margins the Fragaria blossomed out. Clover and a yellow sunflower also in bloom now. The water level in main rivulet reduced about $\frac{1}{2}$ from few weeks ago. However, seepage flow continues W side of meadow, and thermal unit still submerged where I have water thermograph. Thermograph 22 yards E of small lodgepole pines living meadow. It is 8 yards W of main rivulet. Thermal element is in slow moving flow 1" below surface in loose silty ooze.

L. Karlstrom
1954

Bufo canorus (37)

June 21 Peregrine mdr., 7300 ft, Y.N.P., Mariposa Co., Calif.
width of rivulet here 10-12". Flow comes in from
many directions. This is approximate position where
→ toad taken. Distance to road 90 yards S.
Meadow drier than ever before, only soggy in lower
sections. Insects numerous - lady bugs, flies. Max-
min. air 4:30 P.M. (D.S.) 88-28° F. Present 78° F.
in shade. Soil max-min. 85-32° F. Present 74° F.

Surface - 22° C.	Water temp. in rivulet W of
6" - 18° C.	weather station 4:50 P.M. (D.S.)
12" - 16.2° C.	25° C. (bull shaded). Dwarf
18" - 15.5° C.	willow leafed out & catkins
24" - 11.0° C.	half developed.

June 28 Same locality. Check made for canorus at meadow
about ^{6900 ft.} 3/4 mile N of Peregrine mdr., Hyla only.
Air max-min. 84-31° F. Present 69° F. } Peregrine
Soil " " 83-34° F. " 68° F. } mdr.

July 10 meadow at start of 21-mile Tioga mine Road, 8300
ft., Tuolumne Co., Calif.
Plenty of running and standing water here. Rana adults
and large tadpoles present. Also Hyla toads (to 3/4"
body length) seen. Wildflowers blooming - monkey
flowers, shooting stars, "knob-weeds", Rhodod., asters.
no sign of toads any form. Seems a good
locality but lack of open low grass meadow areas
may be a factor. 4 adult yellow-legged frogs
taken.

E.L. Karlstrom
1954

Bufo conurus (38)

July 10 150 yds. E Tioga Pass Ranger Station, 9900 ft.
Mono Co., Calif. Adult males active. One in open
grass 2-8" tall and scattered. Shallow drying
rivulet bed. Marshy area with standing pools.
Cloacal temp. 28.2°C . at 3:44 P.M. (D.S.) Air
temp. (bulb shaded) 1" above wet ground 19.5°C .
Tads in shallow ditch with silty bottom, <1"
deep, temp of water 28.5°C . The pond where I observed
eggs & tads 3 weeks ago is now at most 4" deep
in middle though about the same the same area.
Tads were spread over pond then before. Sample
taken. Water temp. 31.4°C . at point where tads
swimming in $1\frac{1}{2}$ " water. Silty bottom. Grass
10-12" above water surface. Some juvenile tads
collected here. No calling of adult males, Very
windy up on knolls but quite still in lower
meadow areas. Mosquitoes thick and ferocious
and me without my 6-12.

Same locality. Brief evening check 8:30-9:00
P.M. no adult $\text{o}\overline{\text{o}}\text{o}$ calling but scattered
male Hyla chirps. Breeding of conurus seems
to be through at this time. The water level
of large pools remains about the same but
shallow runoffs and pools are dry or about
 $\frac{1}{2}$ reduced in flow. my ~~water~~ ^{quick-recording}
thermometer found broken in its case due to
some joining of it, so no temperature records
this evening. Cool, in $50\frac{1}{2}$ by 9:00 P.M.

E.L. Karlstrom
1954

Bufo canorus (39)

mono Co., Calif.

July 11 200 yards E Tioga Pass Ranger Station, 9900 ft.

10:15 A.M. (D.S.) meandering drying up seepage flow over 20 yards of grassy open meadow. Average depth of water $\frac{1}{2}$ - $\frac{3}{4}$ " but some pockets to $1\frac{1}{2}$ ". The tadpoles are spread out over whole area where water deep enough. Maximum width of seepage flow 4' across. Bottom loose & silty. The toads tend to congregate in deeper pockets but no more than about 50 seen at any one spot. No algal development visible to me, but the toads seem to be grazing on detritus of surface layer of bottom silt. They tend to face southward against what little current there is. All these toads probably (?) come from one mated pair which bred after my last visit here. The water was a few inches deep then. Now there is no snow left on N facing slopes 50 yards to S of here. In fact only snow seen was 1' x 3' remnant in bottom of small gully 75 yards NE of Ranger Station. Isolated small (about 100 feet across) patches are left on N facing slope of mt. Dana. These should not last a week. The larger ponds (lakes) in area are full but smaller meadow pools are going fast. Bob House at Ranger Station reports relatively warm night temps. last week. The toads described above show no hind limb development. It is doubtful that they will have time to emerge. Evidence points to a

E.L. Kodatun
1954

Bufo canorus (40)

July 11 NE Tioga Pass Ranger Station, 9900 ft., Mono Co., Calif.
high canorus tadpole mortality as with boreas
in Yosemite Valley due to drying out of breeding
pools. Mosquitos thick again today. Sky clear and
sunny and a brisk southerly breeze. Adult ♂♂
canorus collected along with Rana and small adult
Boyla. Juvenal toads out & active in seepage
areas. Most appear to be 1-year old. I did not
hear any male toads calling between 10-11 today.
many adults and juvenals collected. The females
taken were subadult, possibly breeding 3-year
olds. The ratio of adult ♂♂ to ♀♀ still
10:1 in meadow areas covered.

2 miles ^W W of Sonora Pass Summit, 8800 ft.,
Tuolumne Co., Calif. Check made here 2-3 P.M.
Sunny, clear skies and very strong westerly wind.
Snow patches on highest peaks but the large
patch S & SE of the meadow has melted. Running
or standing water only at lowest areas where
willows (to 5') border SE side of Deadman Creek.
Creek itself $\frac{1}{3}$ to $\frac{1}{2}$ of former (June 1) size and
readily gotten across. I found no signs of toads
at all in area. Water to 2-3" deeps some
low spots under willows but few available
good breeding sites. Rana boylei found in
rivulets. Wildflowers at peak - western blue fly,
brodiaea, lupines, gilia, forget-me-not, whorled
penstemon, etc. Another low meadow area about

E.L. Karlstrom
1954

Bufo canorus (41)

July 11 W side of Sierra Pass, Tuolumne Co., Calif.
 $\frac{1}{2}$ mile W down Hwy 108 proved almost dry.
more wildflowers but no amphibians. The
available good breeding sites are almost all
dried up in this area. I suspect that the
good populations are foregoing breeding ^{this year} at
site where Joe Gorman had observed adults
~~near willows last year~~ in vicinity of the
willows last year.

E.L. Karlstrom
1954

Bufo canorus (42)

July 16 Yosemite Museum, Yosemite Valley, Calif. While feeding the reptiles this morning I noted a case of apparent natural protection afforded the Yosemite toad σ by its poison glands (?). I placed an adult $\sigma\sigma$ in cage with about 6 garter snakes, both T. elegans couchi and T. elegans elegans. Three became interested in the toad as soon as it hopped along the floor of the cage. Two moved forward as if to strike but veered away after their flicking tongues came within $\frac{1}{2}$ " or so from the toad. This happened 4-5 times involving different snakes. I then placed an adult Hyla in the cage and within a minute it had been taken by one of the mountain garter snakes. Two days ago a 20" mountain garter snake took an adult Rana boylei without hesitation.

July 21 Photographed young adult and subadult toads trying out new portrait attachment on my Argus. Background moss from Sentinel meadow. See separate sheet for exposure records.

July 23 While changing water in gallon jugs holding a series of Tioga Bass toads, I noted a pair in amplexus. Body length of $\sigma\sigma$ 32 mm. ^{ELK # 310} Definite greenish-yellow male coloration. Body length of ♀♀ ^{ELK # 311} 50.2 mm. Pair moved to separate dish away from other 3 subadult toads in with them. Pair separated during process.

E.L. Karlstrom
1954

Bufo canorus (43)

- Aug. 1 Peregrine Mdw., 7300 ft., Y.N.P., Mariposa Co., Calif.
max-min. (air) 11:45 A.M. 88°-46° F. Preest
78° F. no flowing water in rivulet but bottom
of rivulet has some shallow pools. Upper meadow
has no standing water. Queen Anne's lace predominant
flower blooming, to 12" height. Dodecatheon finished
flowering. Buttercups, penstemon, mountain asters,
mt. daisies all in bloom. Lower area of meadow
still boggy. I moved all thermograph equipment
but left max-min. station in position.
- Aug. 2 Tioga Pass Ranger Station, 9900 ft., Tuolumne-
Maro Co. line, Yosemite National Park, Calif. Talked
with Doug Rafferty on duty at the station. He
reported finding another ♀ adult up Glacier
Canyon on NE side of mt. Dana. It was in
3rd lake down from upper one showing on
U.S.G.S. topographic (mt. Lyell) sheet. Tadpoles
also noted but these may have been Hyla ?
However, the toads were real black, according
to Doug, and these probably were Bufo? Numerous
along stream pools.

E.L. Karlstrom
1954

Bufo communis (44)

Aug. 2 200 yards E of Tioga Pass Ranger Station, 9900 ft.
Mono Co., Calif. Low areas of seepage described
last trip now show a few ~~to~~ metamorphosed
toad young. Most tadpoles are still in the
very shallow $< 1''$ silty pools. The water is
fresh and shows slight movement, however. The
toads swim right through the silt when
disturbed but at this time they usually lie
motionless on top of it. The emerged toads
have a body length of about 11-12 mm. One had
a 3 mm. tail stump. Water temp. 12:05 P.M.
(D.S.) in $\frac{1}{2}''$ deep moving flow where toads present
28.5° C. Air temp. here the same. One-year
old toads numerous over boggy grassy meadow
here. Dryas adults also taken in grasses. Sample
of toads collected here. One part of runoff 2' wide
(in places, dry others) with depth $< \frac{1}{2}''$ had 6 dead toad toads in 4' of its
length. All the dead had tails at least 8 mm. long.
These apparently had not quite metamorphosed and could
not quite move out of water. Adult male toads
out but not calling. Rana boylei also taken
along these silty shallows.

Photos taken with Voigtlander 4x5 on Plus-X.
#6 facing N with meadow in foreground where
young toads taken. Time 1:30 P.M. (D.S.)
 $\frac{1}{100}$ th at F12, male toad heard 50 yards
N of my position at this time. A beeble
low trill of 3-4 seconds duration, repeated

E. L. Karlstrom
1954

Bufo corvus (45)

Aug. 2 Tioga Pass, 9920 ft., Wyo Co., Colo.

3-4 times in 2 minutes. #7 plus-x a close-up of shallow run-off where Bufo toads present. Depth (max.) 1" here. F10 at 1/100th. #8 a shot of lake 300 yards E of Ranger Station. Lake 30 yards wide, 6" to 2' deep at edges but about 8 feet deep middle. Seepage flow into it, water clear. Silty bottom. 2:05 P.M. Adult male toad swam from edge to the bottom of the pool 4' from edge. Depth 2' here. It curiously assumed an upright position, legs on bottom, forelimbs spread apart and remained so for 2 minutes. Then it returned again to the bank and remained at water surface, head $\frac{1}{2}$ out of water. Water beetles in lake but no signs of corvus toads. Bufo toads at shallow^{SE} margin of lake. Emerged Bufo toads in seepage flow over E side of it. Few toads still in < 1" deep seepage water.

The overall picture of the meadow is similar to that noted 3 weeks previous. The grasses and sedges are to 16" height. Meadow flowers now in bloom are mountain asters and daisies, whorled penstemon, low (to 3") monkey flowers, few shooting stars, buttercups, brodiaea. The swamp onion is in full bloom in clumps along the rivulets, to 2' height. Clumps of dwarf willow to 6' height on N facing slope of draw. Cathartes dying up. Only very small snow patches noted on n-facing slopes of Dana

ELKordstrom
1954

Bufo corvus (-16)

Aug. 2 Tecopa Pass, 9920 ft., Mono Co., Calif.

and other peaks, and only half dozen of these are visible. Deep snow flow in meadow holds eye, but rain of past week or so partially responsible. Sky hazy 2-3 p.m. with thin clouds covering $\frac{1}{3}$ of sky. Strong wind from SW holds eye, mosquitoes not bothersome until about 3 p.m. when sun partially obscured. Spiders very numerous in boggy areas where toads plentiful. There may be a main source of food? Deer dung noted as well as tracks of doe and fawn in mud. Also tracks of small canid (coyote?) and mice. Microtus observed among grasses.

In larger pond described a month ago (eggs first observed here) no signs of toads or emerged toads. Hyla toads & tiny metamorphosed frogs only. It seems that Bufo shift right away from breeding site, whereas Hyla remain near water (and head back for it when disturbed) for longer period.

Aug. 15 Sunrise Lake, _____ ft., _____ miles of Tecopa Lake, Tuolumne Co., Calif. Fishing trip up here. Hiked down Tecopa Creek (now dry) and eastward over ridge to the lake. Ponds left in stream bottom below Tecopa Lake. Hyla toads only - body length $\frac{3}{4}$ ". The lake itself contained no tadpoles, and I found no adult amphibians. Lake a depression in granite slope. Effoliated slabs of granite to east of the lake. Clark's nutcracker, wh-crowned

E. L. Kalstun
1954

Bufo conurus (47)

Aug. 15 Sunrise Lake, ft., Tuolumne Co., Calif.
sparrows, sierra juncos, robins seen in vicinity.
Small meadow near round lake still moist. Willow,
juniper edge grassy area. This would appear to
be conurus habitat but lack of ready access
into the lake area may have kept toads out.
Steep 30° slope up to lake from Terry Creek
valley below.

Aug. 30 200 yards NE Tioga Pass Ranger Station, 9900 ft.,
Mono Co., Calif.. Check of meadow area here.
Sky about 30% light, thin cumulus type clouds.
Sun 50% normal intensity when partially obscured
by clouds. Wind 25-30 m.p.h. from south thru
the Pass. Temp. (bulb shaded) at 10:15 ^{a.m. (D.S.)} 1" above
dampish meadow mud 14.9° C. Overall appearance
of meadow is greenish-yellow to brown as the
annual sedges and grasses are drying up. Swamp
onion is dried up, along with asters, daisies. One
flower still in bloom, 4 inches high, tubular bell
shaped flower. The rivulet leading North-east
through the meadow is still flowering. Maximum
water depth is 4 inches. At its lower end the
formerly swampy breeding area is $\frac{9}{10}$ dried up,
but some ^{sh}allow puddles (to 2" depth) and damp
muddy areas left. 10:50 a.m. Small recently metamorphosed
and one year old toads found in moist depressions.
A one year old in Microtus runway under 1"

ELI Karlstrom
1954

Bufo cororus (48)

Aug. 30 200 yards NE Tioga Pass Ranger Station, 9920 ft.
Mono Co., Calif.

of road. Temperature 12.2 C. Three r.m. toadlets about one cm. long on damp surface 4 ft. wide open patch of earth. Sedges to 18" surrounding dry sink whole. Dark toads match beautifully with wet dark brown humus soil. Moisture can be rolled out of ball of soil when pressed between fingers. Surface temperature 11:00 a.m. in sun where toads active 20.6 C. larger shallow (to 4" depth) pond on northeast side of meadow where canon eggs just discovered in same size. No tadpoles present. Grasses to 14" throughout pond. Water temperature 13.2 C. 1" below surface. Young tree-frogs numerous in grassy areas. In most grassy areas of the meadow very few young toads out at this time. Spiders and grasshoppers abundant. Adult male toad spotted at edge of rivulet bank. Mossy damp area, shaded. Toad moved under overhang of 18" high ditch. Temperature 16.5 C. at soil surface in shade. Cloacal temp. 14.4 C.

"Pond" 250 yards E of Ranger Station, 9930 ft. Adult ♀♀ toad at edge of this lake 120 yards long and 70 yards wide. Depth about 10' (?) middle and 1-2 feet edges. Sides steep, a sink-hole type of lake. Bottom silty. Grasses all around, scattered pines surrounding but not at lake edge. Toad in sun at edge of lake.

EL Kalsturn
1954

Bufo corrus (49)

Aug. 30 200 yards NE Tioga Pass Ranger Stat., 9920 ft., Mono. Co.
Bank here 14" but level muddy spot near water's edge.
Observed 12:35 P.M. (D.S.) 20.1° C. Air temp. at mud
surface (in sun) 20.3° C. Active large adult. Dived
into water as I grabbed for him. Previously I've noted
this behavior, in rivulets as well as lakes. Adult
mole 10 feet north of ♀. In sun on wet mud
among grasses. Observed 12:45 P.M. 23.5° C. Air
same in sun over mud. Note browner coloration this
mole. Apparently toads have some blending abilities.
Yellower to greener over grasses - previously noted.

ELI Karlstrom
1954

Bufo caninus

Summary of field data on development at
Tioga Pass, 9920 ft., Mono Co., Calif.

June 1 - ♂ calling.

June 19 - eggs and recently hatched out toads.

July 10 & 11 - tadpoles collected but apparently none
metamorphosed. ^{no hind limbs.} Series of juveniles 16-26 mm.

(1-yr. old) collected along with subadult and
adult toads.

August 2 - tadpoles (legs developed) and metamorphosed
toads just beginning emergence from water.

August 30 - many r.m. toads minus tail stumps.
no tadpoles in water.

Egg deposition probably end of first week in June.
metamorphosis began about middle of July.

Probable times below:

Egg laid - (5-10 days) - hatching - (20-35) metamorphosis

ELKarlstrom
1954

Bufo conours (50)

Oct. 15 Preserved adults from Aug. 30th Tioga Pass collection. Some reproductive notes:

ELK # 369 ♀ L =

Egg mass fills abdominal cavity but no swelling of it noted external appearance. Ovary largely composed of black "eggs" 1-1.5 mm. diameter, but hundreds of cream-colored follicles \approx 0.5-0.8 mm. diameter scattered among black eggs. Oviducts < 2 mm. width, highly coiled, not looking any eggs. medium sized golden-colored fat body this female.

Some Tioga ♀s may not have deposited eggs this season (?) since I found evidences of possibly 3-4 females having laid. These appear to be in process of developing new (1955) crop of eggs.

ELK # 363 ♂ L =

Appears reproductively a potential breeder. LT = 6.5 mm. RT = 7.2 mm. Fat bodies shriveled to some degree. Colon cream-colored & opaque - appears diseased.

ELK Station
1954

Bufo conurus (51)

Oct. 16 100-200 yards NE Tioga Pass Ranger Station, 9920 ft.,
Mono Co., Calif.

Arrived at locality 2:20 P.M. Gale-like winds from S to SE over Pass. Sky mostly clear but with few cirulus-stratus clouds. Air temp. 2:25 P.M. 6" above grass 14.20°C. Water temp. in 2' wide rivulet in which 6-8 adult Rana seen 11.80°C. meadow area producing toads before now appears barren of them. One muddy sink hole 4'x6' surrounded by 14-18" dry grasses had surface of mud temp. 19.1° at 2:38 P.M. In full sun and partially protected from cold wind by hill 20 yards S. This area had numerous young active toads Aug. 30th. Cold night temperatures are indicated by frozen mud under grass clump edges at N side of rivulet. Ice crystals down to 2" depth certain spots. Water temp. large deep (to 8-10') pot-hole 50 yards NE of meadow locality above 9.70°C. at 2:55 P.M. Air temp 2" above grass edge of sink (bulb shaded) 9.5°C. 3:00 P.M. No sign of toads, young or adult. On this typical sunshiny day the air temp now should be close to maximum for the day. Evidence suggests that conurus have hibernated. Only a half dozen or so spiders seen on meadow grass and mud surface compared to hundreds seen Aug. 30 and before. Dick Russell ~~probably~~ saw a lace-wing? skimming surface of sink. Otherwise, no grasshoppers or other air-borne insects out. meadow grasses all dried out along with flowers,

E. L. Kalstrom
1954

Bufo cinnurus (52)

Oct. 16 Tioga Pass meadow, 9920 ft.

Grosses to 16" height - and higher margins of sink-holes where bases of shoots greenish. Dwarf willow leaves dry and falling. The meadow bottoms have obviously seen seepage due to fall rains, since water level up an inch or two from August 30th. No ^{general} snow in Sierra yet this fall, although rocks had frost during past week.

Kalstein
1954

B. caroux (53)

Tioga Pass weather records.

Oct. 16

maximum-min. thermometer vertically placed at side wall of entranceway to Tioga Pass Ranger Station. Fully shaded, facing N away from prevailing winds.

August
~~Sept.~~

min-max.

1	72
2	—
3	—
4	44-60
5	40-65
6	46-68
7	47-69
8	48-66
9	—

Aug. 24	42-60
25	38-58
26	32-51
27	—
28	41-61
29	39-67
30	49-67
31	—

rain late P.M.

10	—
11	44-63
12	42-61
13	37-60
14	36-55
15	36-58
16	40-59
17	—
18	42-65
19	40-58
20	38-56
21	41-61
22	42-63
23	44-63

Sept. 1	50-68	15	38-60
2	38-66	16	34-61
3	—	17	30-56
4	40-59	18	—
5	40-64	19	—
6	42-61	20	38-
7	38-50	21	—
8	—	22	38-57
9	40-65		
10	37-51		
11	—		
12	29-64		
13	34-69		
14	35-68		

ELKordstrom
1954

B. conours (54)

Tioga Pass Temp. records

Oct. 16

August and Sept. primarily clear. High winds recorded nearly every day.

Sept. 22 hurricane winds 'til 1 P.M.

Sept. 27 cloudy P.M. with first rain.

Oct. 3 snow flurries late aft.

Above data taken by rangers on duty Tioga Pass entrance station: Doug Rofferty, Robt. House, and at least a third ranger.

E.L. Karlstrom
1954

General notes Bufo

April 5 Yosemite Valley, Mariposa Co., Calif. R. Stebbins suggests that Bufo boreas may be collected at the following localities on the Valley Floor:

- 1) Stoneman Mdw. west of Camp 14. He has seen toads here but site not recommended for study area due to influx of people during the summer season.
- 2) W and SW of Old Village along the Merced River. Probable spot is where small creek from Sentinel Rock area flows into the Merced. Advantage of this locality is proximity to Camp 19 where I and family will be living.
- 3) $\frac{1}{4}$ mile west of Ahwahnee Hotel. RCS suggests the west side of a footpath which leads NW toward Government Center.
- 4) SW side of road leading from Camp Curry to Happy Isles
- 5) Leidy Meadow south of Indian Village a possibility although RCS has not collected there.
- 6) El Capitan Meadow at foot of El Capitan another possibility.

Joe Gorman suggests that marshy meadow areas E and NE of Mt. Broderick (altitude 6100') should be checked for toads. Take Nevada Fall Trail past Liberty Cox to Half Dome Trail.

RCS gave following suggestions on getting thermal data in the field:

- 1) Direct cloacal temp. Insert bulb all the way. Keep fingers as far from bulb as possible

April 5 using a grip on a forelimb if possible. Some grass may help to insulate bulb from your hand.

2) Substratum. Bulb just below surface.

3) Air temperature. One inch above ground. Shade the bulb from direct sunlight and keep dry to avoid wet-bulb effect. Good trick is to prop thermometer in position, go on writing notes, until recording at equilibrium.

4) Water. Just below surface in shallows but note effect of different bottom composition.

For reptiles an air temperature 3 feet above ground may show variation.

Amphibians

Bute boreas X *canorus*

EL Karlstrom
1954

Growth Bufo coronatus x boreas
hybrids

Oct. 7 Hybrids of Yosemite Valley ♂ x Tioga Pass coronatus ♀ have been taking hamburger and grated liver mash in aquarium here at MVZ. However, the recently metamorphosed toads have been dying off. Today I noted scavenging by the toads (hind limbs developed) on a dead recently metamorphosed toad. I removed 8 from aquaria which had all limbs developed. This leaves 23 toads (all breeding) in large 12x20" tank. Water depth kept about one inch. Single aerator with two stone filters, one for each end.

Forced feeding technique on emerging young. William Thurmond suggested technique, having found it successful on Hyla regilla late toads and metamorphosed tree-frogs. He froze chunks of lean beef and then grated them with a kitchen grater. Wrapping meat in a cloth, wring out excess moisture. Then add enough cod liver oil (U.S.P.) to give smooth consistency. This mash is sucked up into a syringe (I use 3 cc. one) and injected into animal's mouth. A pair of cover slip forceps aids in getting their mouth open. The mouth is held shut after injection to lessen regurgitation.

My larvae are so small the glass opening of a 3 cc. syringe will not go into their mouth. I snipped off the sharpened beveled end of a B-D #18 hypodermic needle and

ELKarlstrom
1954

Growth Bufo hybrids

Oct. 7 filed the edges smooth. mash of liver (I used grated lamb liver) passed through needle with ease.

10:20 A.M. Animals force fed:

<u>no.</u>	<u>Body L</u>	<u>Tail</u>	
1	10.9 mm.	11.3	
2	11.1	7.2	
3	10.7	4.5	
4	9.2	4.1	very weak.
5	9.9	8.6	
6	10.7	2.1	
7	10.2	8.9	heavily injected!
8	9.2	7.8	

11:00 A.M. Animal #4 shows no reflex movement when leg pinched with forceps. Others are living, 3 or 4 are in alert head-raised stance, some fluttered against damp bottom of $5\frac{1}{2} \times 8\frac{1}{2} \times 5\frac{1}{2}$ " aquarium used for these toads.

The small size of these toads makes force feeding difficult. The end of the blunt needle could easily have done serious internal damage or the force of the injection mass itself.

Vestigial-winged Drosophila added to small aquarium. Bottom of aquarium lined with slightly damp paper towel. Dr. R. Eakin has reason to believe that fruit flies themselves are not a

EL Kadstrom
1954

Growth Bufo hybrids

Oct. 7 complete diet for young amphibians, since Hyla never survived well on flies alone (personal communication)

Oct. 8 10:10 A.M. 3 young of genus force fed have died. One had received heavy injection of liver mash, and I suspect its digestive tract may have been ruptured.

Added vestigial-winged fruit-flies today. no signs of feeding. One of adult, living toads (3 mm. tail bud) is bloated as if it did receive the liver mash. The water at one end of aquarium had particles of the mash this A.M. Some of the injected mash must have been later regurgitated by the toad.

Oct. 10 Another recently metamorphosed toad dead. Small meal worms placed in aquarium untouched. I added a few more Prosochila.

Oct 12 another dead this morning. 3 remaining are thin but active.

Oct 14 3 still alive. I now am trying the insect "funnel technique" using a large to drive tiny insects from leaf litter. Water gopher from edge of Strawberry Creek W side of MUZ. Poor yield first 8 hours, but few ants & mites (?) added to toad aquarium.

El Karakoram
1954

Bufo conurus x B. boreas

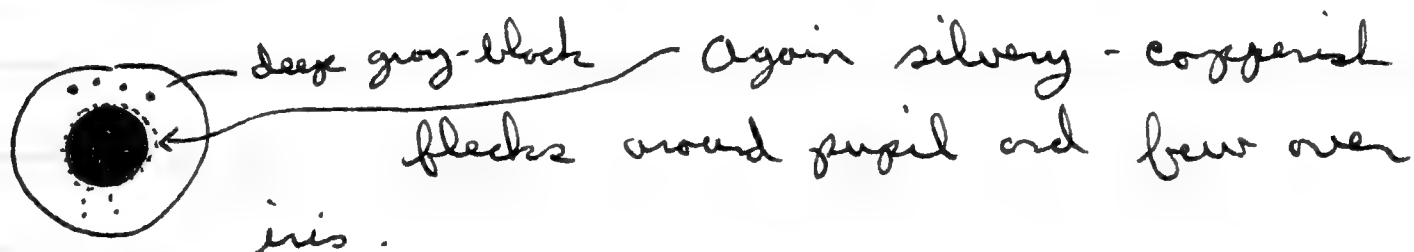
Oct. 10 Tadpole of Tioga Pass conurus ♀♀ x Yosemite Valley
⇒. (see drawing)

M.S. 222 used to quiet tadpole.

B.L. = 11.1 mm. Tail 17.0 mm. Interorbital distance
2.7 mm. Distance from tip of snout to a line
drawn transversely front of eyes 2.1 mm.

Body and muscular portion of tail deep gray to
blackish but the tail membranes almost lacking
in melanophore expression - few flecks mostly dorsal
region.

Silver-copperish flecks present scattered over
postero-ventral region of body but few anterior
to spiracle.



Teeth $\frac{3}{3}$ with fringes laterally. The uppermost
of lower labial rows continuous across midline.

Oct. 14 In checking hybrids (tadpoles and tail bud stages)
in large aquarium, I noticed one toad with
peculiar spotting or blotching dorsally.

Body length 11.2 mm. Animal fat and apparently
Tail 4.1 mm. in good shape



Ventral region blackish except lighter
throat.

med. brown (salt & pepper effect)

deep dr.
brown to
black

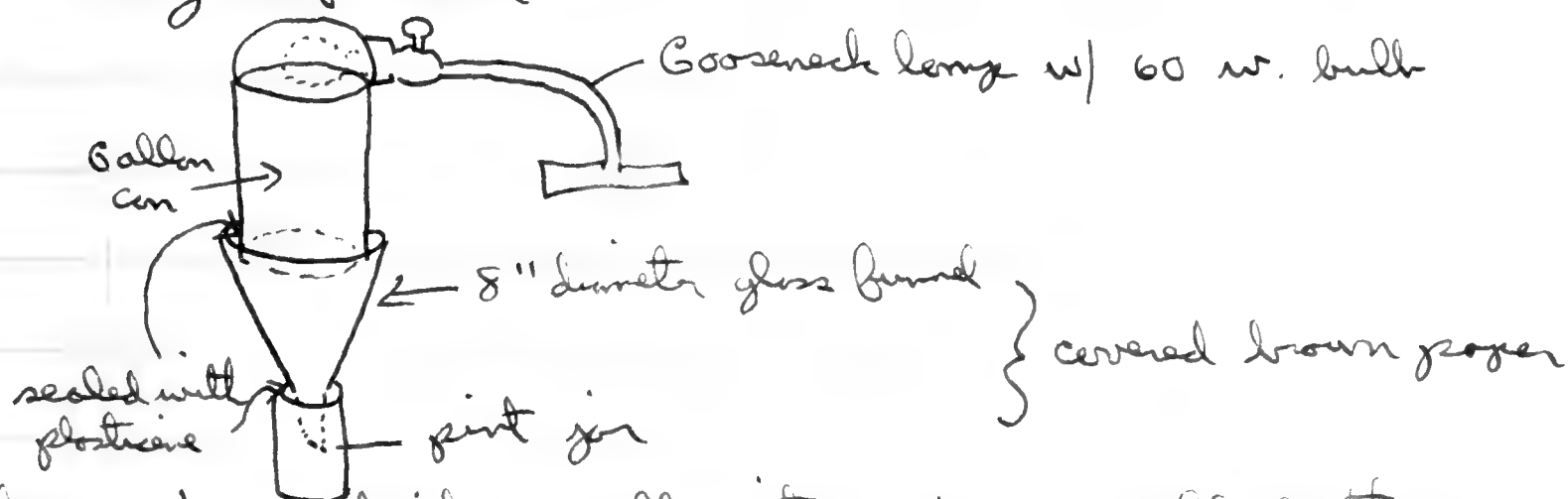
A few others show dark mottling
but are overall uniformly darker.

ELKardium
1954

Bufo corrus x B. boreas

Oct. 20 Tadpole food dead in small aquarium. Constant supply of Drosophila have been provided, but the tadpoles have been observed taking but a few of them. The yeast odor of fruit flies plus their high proportion of chitin may render them poor diet.

Oct 21 Funnel set up again to gather small insects from bog leaf litter.



Oct. 22 $1\frac{1}{4}$ " centipede, small mites and a small beetle collected. Leaf litter not dried to lower layers yet.

Poor luck with 2-3 batches of leaf mulch from along creek near LS83.

Oct. 25 Tried tiny (< cm. long) meal worm larvae. one tadpole attempted to snap a larva up but could not. Storage products beetles from Gene Volz' meal worm cultures tried. Certain of the tadpoles went after them, and a few were caught. Beetles may bite the tadpole, since the tadpoles often underwent active jumping movements after taking them.

Nov. 1 Some tadpoles skinny, not feeding. Dead removed and preserved. Others fat and apparently feeding on the tiny storage products beetles (+ fruit flies) given them.

EL Karlstun
1954

Bufo boreas x B. conarius growth

Nov. 6 Attempt again at force-feeding 4 of the 9(?) metamorphosed toads in the terrarium. The least of group chosen. Two are very emaciated and weak.

Sizes of those fed:

#1	B.L. = 10.1	} weak, no gular movements.
2	10.3	
3	10.6	} healthier. Given little mash.
4	9.9	

4 | 40.9

avg. 10.2 mm.

hank liver grated into fine mash. mixed with cod liver oil. injected through blunt hypodermic needle B-D #18 and 3 cc. syringe. mash very fluid and easily forced out of syringe.

Nov. 7 #1 & 2 above found dead. 3 & 4 active - returned to terrarium. more storage products bottles added, and at least two toads took them. all four force-fed individuals had been kept separate in small (3x2") staining dish overnight, bottom of dish wet.

Tadpole nearly dead in aquarium. 3 had not reached metamorphosis by this date. none observed to feed on fresh liver mash placed in aquarium. B.L. of tadpole 11.9 mm., T. = 17.7 mm. hind limb stage, total length hind leg \approx 7 mm. large depigmented area with bloody spot on mid lateral right side.

EL Karlstrom
1954

Bufo boreas x canorus hybrids

- Nov. 7 External bulge of yolk. 2 mm. wide area appears to be a tumor (?) Probably not mechanical injury. Larval teeth $\frac{2}{3}$ with lateral labial fringe. (see figure). Two other living toads same age and development showed same tooth pattern.
- Nov. 8 One of living tadpoles died during night. Census of living metamorphosed toads seven. one tadpole left this date. This animal continued to feed and develop. Larvae of meal-worms, fruit-flies, storage products beetles taken.
- Dec. 17 One hybrid alive. Length 14.2 mm. coloration is uniformly deep brown similar to soil in aquarium. Scattered tubercles over back tipped with reddish brown. Venter brownish-black but throat & abdomen salt-and-pepper effect with off shade white or dark.
- Feb. 10 Same hybrid dead from desiccation, since I neglected to water the aquarium over weekend. Apparently healthy to time of dying out, had fed on small meal worm larvae Feb. 4th and about 15+ mm. snout-vent length. All reason to assume this animal would have continued growth and development.

Le Finis

Alas, poor canorick! I knew it well.....

EL Karlstrom
1954

Bufo boreas and Bufo canorus

Oct. 4 See R.C. Stebbins' field notebook July 3, 1951 for description of apparatus and technique. This set-up used by Hendrickson, Stebbins, Rosenthal with but slight modifications. I used 4" peanut butter jars to house the animals, 4 thicknesses of saturated paper towel, and a larger 5 mm. glass "breathing tube". The water stirrer I used was a Fisher propeller-type (60 cycle) one. 3 0-50°C rapid recording thermometers were used, all agreeing within 0.1°C. of each other. One of these was used to check water bath temps in addition to the -20-110°C thermometer clamped in position.

Hot plate set at "6.5" and warmed prior to placing the water chamber in position. The stirrer was efficient since ^{surface} water temps. varied < 0.1°C. any part of bath. However, jar B was lower in position and closer to the hot plate. Following Expt. #1 I re-calibrated the Shuttles quick recording thermometers. The one in jar B reads 0.3°C. higher than the other two at 20-25°C range, but above 40°C all three agree. Therefore, I'll leave the recorded temperatures as they now stand.

Critical maximum temps.

ELK station
1954

Bufo canorus and B. boreas holophilus

Oct. 4 Expt. #1

B. canorus ad. ♀♀ ELK #369, L=49 jar A (Tioga Pass)

B. boreas ad. " " #228 L=67mm. " B. (Yos. Valley)

	<u>Water bath</u>	<u>A</u>	<u>B</u>	
9:44 A.M.	14.0°C.	14.8	14.3	
:52	15.1	14.9	14.8	- <u>boreas</u> exploring, in vertical pos. w head top of jar. <u>canorus</u> inactive.
:56	17.2	15.9	16.0	
10:02	20.3	17.2	16.9	- <u>canorus</u> rotated 90° but not active. <u>boreas</u> exploring.
:07	22.8	21.0	21.6	
→ agitator propeller lowered in water bath.				
:12	25.8	21.6	24.3	- <u>canorus</u> raised on side of jar.
:18	28.0	24.0	27.5	- <u>boreas</u> increased exploration
:20	29.2	26.7	28.6	- <u>canorus</u> now actively exploring - <u>boreas</u> dropped head for 2 min., then continued exploration.
:23	30.4	28.6	29.4	
:25	31.2	29.0	30.6	- both active & movements coordinated
:29	32.8	30.0	32.0	- both spasmodic explor. <u>boreas</u> still more active. Glistening <u>boreas</u> skin.
:33				
:36				- <u>boreas</u> covered when I moved hand over its jar.
10:33	34.8	33.1	34.5	- <u>boreas</u> in distress? now lying flat in bottom of jar but in normal crouched position.
:36	35.9	34.2	35.6	
:40	37.4	36.7	37.2	- both took showing rotational movements but heads off towel. - <u>boreas</u> flattened in crouching position. Its eyes seen partially closed.
:44	38.8	37.9	38.6	- <u>boreas</u> has remained crouched 41 minutes.
:47	I removed <u>B. boreas</u> jar (B) and rotated it. <u>boreas</u> rights itself but slowly. Returned jar B to bath.			

Critical maximum temps.

EL Karlstrom
1954

Bufo canorus and Bufo boreas

Oct. 5 Expt. # 1 (cont.)

	<u>water</u>	<u>VA</u>	<u>B</u>
10:48 A.M.	40.1	(38.8)	39.7
10:49	40.8	39.2	40.2
:51	41.2	39.7	40.9
:53		40.0	

- canorus weak climbing movements
10:46. Crouched position one minute later. In distress
- head wagging. boreas has not moved from crouched position.
- no canorus movement since 10:49 A.M.

Cloacal temp of B. boreas 10:53 is 39.8°C . It is in severe shock. No righting reflex, legs extended backward, and shrunken appearance sides of body.

B. canorus extended legs out 10:53 and head lowered. Cloacal temp. at 10:55 of this animal in deep shock 39.6°C .

Neither toad showed gular movements or could right itself when placed on its back. Placed both on damp, cool towel 10:56. B. boreas was breathing and showed a righting reflex by 10:59. B. canorus showed reflex of eye-lid when probed by this time. By 11:30 A.M. both were moving about.

Both toads were apparently subjected to temperatures higher than their true critical maximum, so the cloacal temps. are not a true indication of lowest temp. at which heat shock is evident, i.e. critical maximum.

Results Expt. 1

Critical max. Bufo boreas $\approx 37-38^{\circ}\text{C}$.
Bufo canorus $\approx 38-39^{\circ}\text{C}$.

EL Karlstrom
1954

Bufo boreas and B. conarius

Critical maximum temperature

Oct. 4 Expt. #2, apparatus same as Expt. #1.

B. conarius ad. ♂ ELK #364, L=

B. boreas young " 226?, L=

(Tioga)
Jar A

" B.
(Yosemite)

	<u>water bath</u>	<u>Jar A</u>	<u>Jar B</u>	
4:25	15.0°C.	15.6	16.1	- <u>boreas</u> exploring. <u>conarius</u> still.
4:28	20.1	18.8	19.5	Both active exploratory move-
4:32	21.5	20.7	20.6	ments.
:36	22.9	22.2	22.3	Same
:40	24.9	24.4	24.0	Both stand on hind legs and
:43	27.1	26.6	26.4	climb sides of jar, often flopping
:47	28.8	27.9	27.9	over on back but righting
:51	30.5	29.6	29.9	immediately.
:54	32.4	31.7	31.9	- Same
:57	33.5	32.6	33.1	- <u>boreas</u> acts like its retreating
:59	34.6	34.0	34.3	backwards into a burrow. Both
5:01	35.2	34.4	35.0	climbing actively, flopping, &
5:03	36.2	35.7	35.9	righting themselves.
5:06	37.7	37.2	37.6	- more spadefoot-like "digging" by
5:08	38.4	37.9	38.1	<u>boreas</u> . <u>conarius</u> upright - fore-
5:09	39.0	38.6	39.0	limbs against top of jar.
5:10	39.5	39.0	39.3	- frantic climbing by <u>boreas</u>
				rotation, head-wagging <u>boreas</u>
				in crouched position.
				<u>conarius</u> actively climbing or
				upright on hind limbs.
				<u>boreas</u> had crouched 41 min. now
				rotated 45°, remained crouched
				abdomen along side of body
				depressed. Very rapid gular
				pulsation.
				- frantic climbing by <u>conarius</u>
				crawling searching <u>boreas</u>
				frantic searching by <u>boreas</u> &
				<u>conarius</u>
				weaker climbing & head bobbing
				<u>conarius</u> . same for <u>boreas</u>
				<u>conarius</u> cannot right itself
				leg extension <u>boreas</u> (cont.)

EL Kolstun
1954Bufo boreas and B. corvus

Oct. 4 Expt # 2 (cont.)

5:10 + corvus removed and cloacal maximum taken 38.6°C .
It regained righting reflex within 30-40 seconds
and assumed upright stance

5:12 boreas cloacal temp. (max.) 38.7°C . It remained
in the warm jar longer and was in deeper shock.
Placed on paper towel, and it righted itself within
a minute, walked within 3 minutes. Also regained
extended appearance of mid-body region. While
in state of heat shock, it had appeared
shrunken.

Since boreas had been inactive for several
minutes near the end of the experiment, it is
hard to determine just when it went into shock.
Both toads became active before losing their
mobility ^{about} at the same time.

Cloacal temps. are probably close to critical
maximum this experiment. No significant difference
between the two species, although boreas again
may have gone into heat shock at a lower
temperature than corvus

Results Expt. # 2:

Critical maximum B. boreas and B. corvus
 $38-39^{\circ}\text{C}$.

* note boreas relatively stunted condition compared to
corvus. Former kept alive in Yosemite museum since
aquarium & received food half of summer.

Critical maximum temperature

ELK station
1954Bufo boreas + B. corvus

Oct. 13 Expt. #3

B. corvus ad. ♀♀, ELK #369 L= Jor AB. boreas, " #384 L= Jor B.

p.m.	Water bath	Jor A	Jor B	
7:03	14.9°C.	15.0	14.9	
7:06	15.5	15.1	15.0	- <u>corvus</u> quiet.
7:08	16.8	16.4	16.0	<u>boreas</u> raised up and rotated erect position.
7:12	18.1	17.9	16.8	<u>boreas</u> rotated again.
7:16	20.4	20.1	19.2	- <u>boreas</u> sitting on thermometer bulb. neither active. - <u>boreas</u> upright & pushing against top & sides of jar.
7:20	23.0	22.4	20.9	- <u>boreas</u> "clawing" at sides of jar. <u>corvus</u> raised to semi-erect position.
7:23	24.5	24.0	23.0	- <u>corvus</u> first moved from original position.
7:25	26.0	25.4	24.3	<u>boreas</u> losing swollen appearance and sides becoming depressed slightly. <u>corvus</u>
7:27				now erect in alert position.
7:28	28.0	27.5	24.5	-head region glances <u>boreas</u>
7:31	29.2	28.8	25.7	- <u>boreas</u> searching.
7:34	30.2	29.9	26.8	- <u>corvus</u> shifted for first time from original spot. Erect, moved up side of jar.
7:37	31.3	31.0	27.5	<u>boreas</u> slight searching movements.
7:39	32.5	32.0	28.6	- <u>corvus</u> actively searching.
7:41	33.6	33.2	30.3	- <u>boreas</u> crouched & still.
7:43	34.7	34.0	32.5	- <u>boreas</u> alternately searching & hunched over, head down.
7:45	35.4	34.8	33.2	- <u>corvus</u> has foot on bulb. not as erect but inactive.
7:47	36.3	35.9	33.3	both sensitive to my movements - low heads.
				- <u>boreas</u> hunched over bulb
				<u>corvus</u> still.

E. L. Karlstrom
1954

B. boreas & B. conurus

Expt. #3 (cont.)

	<u>Bath</u>	<u>A</u>	<u>B</u>	
7:49	37.2	36.8	34.7	<u>boreas</u> desperately searching, "climbing" at glass, then head lowered. <u>conurus</u> some, moving from one end of jar to the other.
:51	38.0	37.7	35.0	<u>boreas</u> violent "climbing", rotation <u>conurus</u> rapid movements, climbing side of jar.
:53	38.9	38.4	37.0	
:54	39.2	(38.6)		- <u>conurus</u> flopped on back and did not right itself. cloacal 38.2°C.
:55	40.0		37.6	
:57	41.5	(38.2)	39.0	<u>boreas</u> in distress. cloacal 38.0°C.

Results Expt. #3:

Bufo conurus and Bufo boreas holochilus
critical maximum 38-39°C.

This large adult B. boreas seemed to respond slower to the critical temperatures than smaller boreas used in Expts. 1 & 2. Possibility of size difference in regard to critical point? This toad had been kept in aquarium behind Yosemite Museum for nearly 2 months, and apparently fed well since it still now is in relatively good shape.

Amphibians

miscellaneous

E. L. Karlstrom
1954

Ensatina escholtzi platensis

April 25 Base of Cathedral Rocks, 4200 ft., Yosemite Valley,
Morisona Co., Calif., 2:15 P.M. (D.S.T.) I found
one adult ♀ (eggs visible) beneath a rotted log.
dark brown loam soil beneath. Site shaded by
pepperwood tree. Slope 20°. Distance from snow
patch at base of sheer rock cliff 45 ft. Rotted
log 3' x 1' x 4" thick.

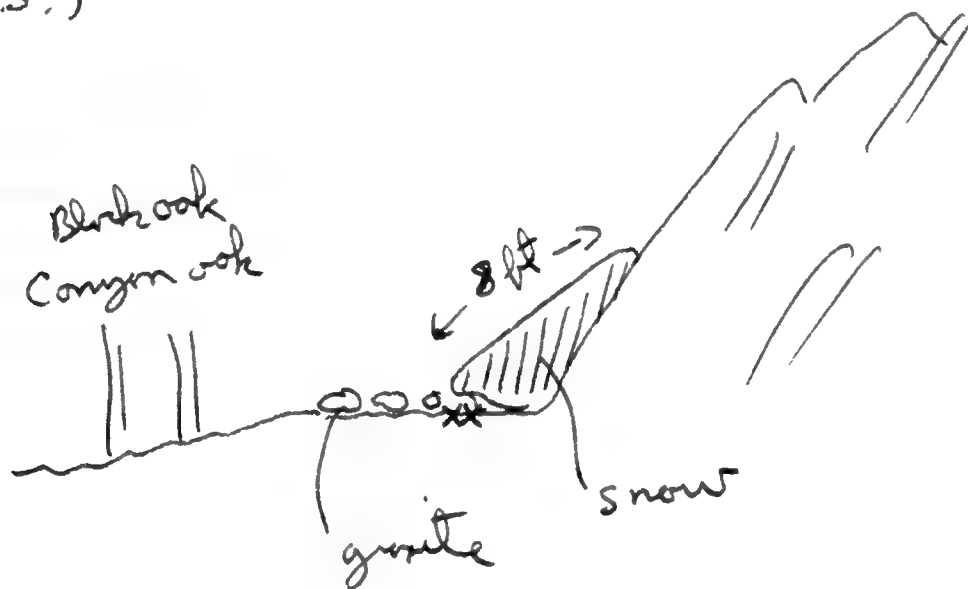
May 1 Base Cathedral Rocks, 4100 ft., Yosemite Valley,
Morisona Co., Calif.

Adult female under slab of rotted tree 4' x 1' x 4"
thick. Soil temp. 5.8°C. Air temp. 1:50 P.M. (D.S.T.)
8.8°C. Area 90% shaded by maple, pepperwood and
oak trees. Douglas fir provides upper canopy. Slope
about 10°. Levelled off area about 70' from base of cliff.
Same general locality as above but 200 yards E and
75 feet higher altitude. One adult under doug fir bark
40 feet north of granite base Cathedral Rocks. Cloacal
temp. 2:35 P.M. (D.S.T.) 10.5°C. Substrate (shaded bulb)
7.2°C. Shed Gambusia skin under same piece of bark.
Air temp. 2" above ground 11.8°C. Slope 20°. Snow
patch at base of cliff 5' thick, 20 feet out from
base of talus slope. Two above specimens left with
Doug Hubbard for display behind Yosemite museum.

E. L. Kalstun
1954

Hydromantes platycephalus

April 25 Base of Sentinel Rocks, ^{4100 ft.} Yosemite Valley, Mojave
Co., Calif. Stebbins collected 2 adults from
beneath a granite ~~fragment~~ ^{rock} 2' x 3' x 8". Overcast
cool breeze, air 10°C $\frac{1}{2}$ " above ground 2:30 P.M.
(D.S.)



Black soil and gray granite fragments where
animals taken. Water can be squeezed from soil.
Plenty of seep.

This is lowest record of platycephalus but animals
must extend down Merced Canyon toward Breckinridge
brunneus locality.

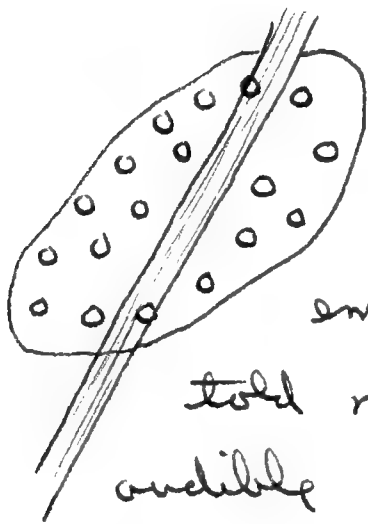
May 1 Same general locality as above. I covered the
base of the cliff over a distance of $\frac{1}{4}$ mile. Only
two seepage sites looked promising. One of these
probably where Stebbins got two animals April 25.
no animals taken. most seep water passing down
steep rock face goes beneath snow directly into
rocky soil and does not show up at outer
edges of snow patches.

May 9 Stebbins took several platycephalus at base of
Sentinel behind Camp Curry.

E.L. Kastner
1954

Hyla regilla (1)

April 8 El Capitan meadow, 3450 ft., Yosemite Valley,
Mariposa Co., Calif. Description of breeding pond
under species account of Bufo boreas although
no toads now in evidence this locality. at
11:15 A.M. I collected a half dozen egg clusters
near margin of the pond. most clusters were
in 6-10 inches of water and attached to blades
of grass or other pieces of vegetation. Average



of 3 counts of number of
eggs was 30. The stages
varied from yolk plug to
emerging tadpoles. Norm Hakenheim
told me that Hyla choruses have
been audible for about one month. The
onset of Hyla breeding activity may have been
the first part of March in the Valley. The
largest free-swimming toads I was able to
net were only 8-10 mm. long and these were
not abundant. However, the egg clusters were
plentiful. Daytime choruses were common at this
pond or elsewhere in Valley meadows. The
calling would generally cease when I got
within 20 feet of any of the males congregated
in or over but later it continued again as
I moved further away. The only adults I
saw out in the daytime were a few
in or right at edge of a pool SE of the

E.L. Karlstrom
1954

Hyla regilla (2)


April 8 Church behind Old Village. A large granite boulder provided a shady niche for these forms. Egg clusters were present here, too. 8:00 P.M. Air temp. 70°C .; water 10°C . soil 6 inches down 10°C . The adult males sat half immersed in water usually on a matted grass surface. Spacing irregular but most males were generally at least a foot from each other. The reaction to the light from my headlamp was consistently that they would back downward into the water and swim forward and downward to the grass or algae at the bottom. I collected many by simply grabbing a handful of bottom vegetation below where I had spotted the frog. The chorus from this pond was deafening - so loud that it was painful to my ears when I was near the pool. At this site all the adults taken seemed to show a similar color phase. Dark brownish ground-color with dorsal blotches nearly black. At Stoneman meadow I detected more of a gray-green ground color with the darker bluish blotches dorsally. Pond C at Stoneman meadow, about 25 feet long, contained about 125 frogs. I roughly counted this many on basis of eye shine. The ponds near Sentinel Bridge were checked. The most boggy ones had no Hyla. ^{are} ~~Does~~ water requirements of Bufo and Hyla basically the same?

E.L. Karlstrom
1954

Hyla regilla (3)

April 8 It will be interesting to observe whether Bufo can breed in brownish-stained boggy pools now shunned by Hyla.

April 24 Stebbins and I checked El Capitan meadow. Hyla toads present but not in numbers I saw 2 weeks before. I saw no egg clusters. Few adults calling. Pond higher by 4-5 inches probably. Some flow into the pool from culvert running beneath the road.

Goat ^{4000 ft.} 1/5 mi. S of Dirt Center, Yosemite Valley, Marysina Co., Calif. Extensive development of pools and run off rivulets here. I was struck by the scarcity of Hyla toads, no eggs seen. Apparently breeding has yet to hit a peak at this locality. Algae not abundant in pools. Water samples taken including insect & toadpole life. Stebbins and I checked this locality about 8:30 P.M. many Hyla chorusing. We both noted that ♂ vocal sacs tend to be wider than long  and possibly not as round than as other Hyla in Bay Area.

April 25 Base of Cathedral Rocks, 4100 ft., Yosemite Valley, Marysina Co., Calif. Stebbins and I were searching the north facing slope of the valley wall for Hydromantes. Going up a boulder stream stream

E. L. Karlstrom
1954

Hyla regilla (4)

April 25 Base of Sentinel Rocks, 4100 ft., Yosemite Valley
Mariposa Co., Calif. 2:15 P.M. (D.S.)

stream bed (now dry) I found one Hyla adult ♀♀ just under the edge of a granite boulder. This animal would appear to be at least a few hundred yards from any standing water and 100 feet above the valley floor with the road between it and the Merced River. The snow at the base of the cliff is another 50 feet above the site where animal taken.

Stebbins also found an adult ♀ in center of barkless rotten log 2 ft. in diameter. Rotten wood 10°C at 2:50 P.M. (D.S.T.) Log 12 ft. long along slope - slope 8° to 11. Frog had not emerged from hibernation? Thin but active when handled. Males heard calling from rocks further up talus slope. Incense cedar, white fir. Canopy 80%. Site where Hydromantes gotten down slope 200 yards E.

April 30 Stoneman Mdw., 4000 ft., Yosemite Valley, Mariposa Co., Calif. Hyla chrousing in the evening 9:00 P.M. (D.S.T.) and one pair taken while amplexing. Sample of toads from pool A taken. (See B. Brown account for temp. data). Recent rains have provided new pools and this may accelerate Hyla breeding activity.

May 27 Kaiser Peak Meadows, 8000 ft., Fresno Co., Calif.
No toads but eggs. One cluster to tail bud stage.
No eggs seen at upper 9200 ft. meadow near Kaiser Pass.

E.L. Karlstrom
1954

Hyla regilla (5)

May 13 Pothole Meadow, 7750 ft., Yosemite Natl. Park,
Mariposa Co., Calif Hyla chorusing here at 8:00
P.M. (D.S.T.) No signs of eggs yet. One pair
in complexus. ♂ let go of ♀ when I approached.
Hyla population not greater now than 2-3 calling
♂/♀ per pond. The pools here average 8 feet
diameter. Some potholes are up to 3' depth along
main stream course. Water temp. pools. 6.5°C .
air temp. 1" above ground (open grass) 7.3°C .
One Rana boylei adult ♀ also taken. Patches
of snow to foot depth scattered over meadow.
Deeper banks to W under the lodgepole pines. Small
wild composites to 3". Snow probably off this
meadow for week or less.

E.L. Karlstrom
1954

Dytiscus regilla (6)

Aug. 2 150 yards NE of Tioga Pass Ranger Station, 9920 ft
Mono Co., Calif. Small pool with tods present.
Pool size $4' \times 4' \times 1\frac{1}{2}"$ maximum depth. mud
bottom. Pool supplied with ground seep water,
a type of pothole. Sedges & grasses bordering it
to 10" tall, also a knotweed (Polygonum) Tods
body length of $\frac{1}{2}"$, total length $1"+$. Beginning
hind leg development. Water temp. $29.0^{\circ}C$. at
11:40 A.M. (D.S.). Air temp. 1" above grass (bull
shrub) $27.0^{\circ}C$. One small adult Bracon in pool.

Hyla regilla (7)

Aug. 30 150 yards E Tioga Pass Ranger Station, 9930 ft., Tuolumne Co., Calif. Recently metamorphosed (of this summer) abundant in grasses. One pond, now $50 \times 20 \times 16$ " deep, still has toads in it with tails, but nearly all have emerged. 12:50 P.M. (D.S.) Young (body length $3\frac{1}{4}$ ") tree-frog noted at bottom of lake 2' from edge in water 16" deep. No tail vestige, light gray phase. Bottom of lake light brownish. It remained there for at least 10 minutes. Possibly I had stirred it up while it rested at the lake edge, forcing it into the water. Another I saw swimming on surface 10' from shore the grassy lake edge.

Oct. 16 same locality as above.

No Hyla seen 2-4 P.M. today. Air temperatures ranged from about $8-14^{\circ}\text{C}$. Some ice crystals edge of N facing banks of ditches and rivulets. Wind of near gale velocity. Hibernation of tree-frogs this elevation may be effective.

Oct. 16 Hyla adults and subadults out in leaf litter in front of Ranger's Club, Gart. Center, Yosemite Valley, Mariposa Co., Calif. 9 P.M. Air temperature 14.1°C .

Oct 17 Dozens of subadult (young of this year?) collected from under a plank near temperature station Sentinel meadow, $\frac{1}{5}$ mi. S Gart. Center, Yosemite Valley. Average body length 5 individuals 19.7 mm. One adult only collected 31.2 mm. Air temp. 9 A.M. 48°F . Few other Hyla active in dew-covered grasses.

E. L. Karlstrom
1954

Rana boylei (1)

- April 7 Bear Creek, 2 mi. S of Buellburg, Mariposa Co.
Calif. One medium sized adult taken in shallow water of the Creek after it plopped in the water from the edge. Water temp. 15°C at 4:05 P.M. air temperature 16°C . This was only frog seen along 150 yards of the creek. Numerous pools interrupt the cascading water. See journal notes for information on boylei Agua Fria Creek 3 miles W of Mariposa. No signs of eggs or tadpoles at these two localities.
- May 13 Pathole meadow, 7700 ft., Yosemite Natl. Park,
Mariposa Co., Calif. 8:00 P.M. One large adult ♀♀ in snow seepage pool 8' x 10' x 8" deep. Water temp 11.5°C . Snow patches present over about $\frac{1}{4}$ of meadow surface. Stream runs through middle of meadow. Deep (to 3') potholes, rivulets, swift water are all available. Hyla chorusing. No signs of any anuran eggs. Snow probably off here less than a week. Air temp. 1" above ground 8:05 P.M. (D.S.T.) 7.2°C .
- May 14 $\frac{1}{2}$ mi. SE of Crane Flat Ranger Station, 6700 ft.,
Yosemite Natl. Park, Tuolumne Co., Calif. 12:15 P.M. (D.S.T.)
Egg clusters (4) here. Loose mulberry appearance of each cluster with attachment to a stem of grass. Water depth at site clusters found 4-5 inches. Representative cluster about 3" long, 2" wide, top of it $\frac{1}{2}$ " below water surface. Eggs large and blackish, oxygen to be unclaved. Pool where eggs found 20' wide

E.L. Karlstrom
1954

Rana boylei (2)

May 14 $\frac{1}{2}$ mi. SE Crane Flat Ranger Station, 6700 ft.,
Yosemite Natl Park, Tuolumne Co., Calif.

40' long, average depth 4". Small stream issues from culvert under road 20 yards to the NE and then spreads out to form aforementioned pool. Loose silty bottom. The egg clusters were covered with a fine layer of the silt. Water flows slowly through the pool, a stick on the surface moving 1 yard in about 15 seconds. meadow here about 40 x 150 yards, lined with lodgepole pine stands, ^{open} meadow free of snow but edges under trees had patches to a foot in depth. Water temp. in pool where eggs found, 1" below surface 2' from edge, 15.8°C .; 12:25 P.M. (D.S.). Air temp., bulb shaded, 1" above dense grass at pool's edge 19.2°C . moderate breeze, sunny afternoon. One adult frog seen in bottom of the pool but it concealed itself in the silt and I didn't get the beggar. No other anurans or eggs seen.

May 21 Kaiser Peak meadow, 8000 ft. Fresno Co., Calif

Adults at lower end of meadow. Egg clusters numerous. To ventral tube stage. Slow moving deep rivulets formed for egg deposition. Water temp. 28°C . 2" below surface in wide place in pool 16" deep. 3 adults here, one caught. 7 egg clusters over 10' of rivulet. Air temp 1" above dense grass 17°C . at 3:55 P.M.

May 23 Boothole mdr, 7700 ft., Y.N.P., Mariposa Co., Calif. 9:10 P.M.

adult ♀; cloacal 13.5, water 14.0.; air 10.2°C . No eggs seen.

E. L. Karlstrom
1954

Rana boylei (3)

July 23 Merced River at base of El Capitan, 3950 ft.,
Yosemite Valley, Mariposa Co., Calif. at 11:15
A.M. (D.S.) I observed one adult frog at edge
of river. It was beneath a clump of willows
and immediately swam to deeper water when
I tried to approach it. Water depth 5 feet
out from the bank 4 feet. This is first
yellow-legged frog I have seen in the Valley
proper. I recall Richard Zweifel mentioning
that he had not seen or heard of them from
the Valley. I check Y.N.H.A. collection at
museum. One R. boylei (Sierrae) # 268 from
Fern Spring, Yos. Natl. Park, 4000 ft. I
am not certain where this locality is, but
no other definite Valley localities listed for
R. boylei boylei. Bullfrogs apparently are
established in a pool at the Ahwahnee Hotel.*
Could there be escapes to the River?

* Note. Later "reliable" information from owner of
~~pair of bullfrogs~~ single adult ♂ bullfrog.
Party worker at Hotel ostensibly raising bullfrog
for Colveros competition, and it is receiving
training in Ahwahnee pool. My informant was
dear-tongued but "feeling good" at beach party
in August given by Ahwahnee chef Pearson
for championship softball team. The punch (vodka+)
was terrific!

ELKarlstrom
1954

Rana boylei (4)

Oct. 16 100-200 yards NE Tioga Pass Ranger Station, 9920 ft.
Mono Co., Calif.

Adults active when disturbed from position shallow water of rivulets and ponds. Temperature of one $2\frac{1}{2}'$ foot deep sink hole in which large adult taken 4.4°C . at 3:45 P.M. This was only anuran found today. Five adults collected, most were gotten from water greater than 6" depth.

Reptiles

E.L. Karlstrom
1954

Coleonyx variegatus

April 14 15 mi. SE Bakersfield, Kern Co., Calif. Dr. Culbertson of Fresno State visited MVZ today. Her reported the capture of a gecko at the above locality by a high school boy in Fresno. The specimen is now in hands of the boy's high school biology instructor and possibly could be gotten hold of. Suggest writing A.E. Culbertson for name of man with lizard.

E.L. Karlstrom
1954

Lampropeltis zonata

April 29 Herp Lab, MUZ. Snake feeding observations.

Stebbins placed snake in metal cage with 3 Sceloporus occidentalis. After but a few minutes (about 8:35 A.M.) the king snake struck the lizard in side of its head. At the time the lizard was in position on the vertical metal screen at the back of the cage. The king snake threw about three coils about the lizard and right away moved around to the head on position. After five minutes the lizard was forced to relax its grip on the screen and the forelimbs were forced back. At 8:42 A.M. the lizard was ^{1/3} ~~half~~ swallowed and no resp. movements by it noted. At 8:50 snake had worked to hind limbs. Glottis noted opening but in normal position. At no time did snake protrude its glottis. 8:53 A.M. Tail disappeared. Total swallowing time 18 minutes. Length of snake about 23 inches. Lizard was adult ♀♀ with total length about 6 inches. This particular snake loaned to Stebbins for illustrative purposes by Doug Hubbard at Yosemite. Presumably a Yosemite area specimen.

E. L. Karlstrom
1954

Thamnophis elegans

June 5 1 $\frac{1}{4}$ mi. SE Half Dome, Yosemite Natl. Park, Mariposa Co., Calif. Broke swimming along bottom of this large (75 yards wide, maximum depth about 4') shallow pond. Depth 8" where it swam. Water temp. there 2:50 P.M. (D.S.) 23.5°C. Air 1" above dense grass at pool edge, 14.8°C.

E.L. Karlstrom
1954

Diodophis amabilis

- April 24 $\frac{1}{4}$ mi SE Buellburg, Mariposa Co, Calif. E. 1200 ft
Stebbins collected one of largest rig-necks he or I
had ever seen. Rough measurements at lab showed
total length $21\frac{1}{2}$ inches. Stebbins temp. measure-
ments: Cloaca 14.0°C , 8:55 A.M., air 1" above
ground 14.5°C .
- May 3 Stebbins placed this snake in live cage with
Xantusia vigilis. The rig-neck almost immediately
seized one of the lizards by the side of the head
and commenced feeding.

E.L. Karlstrom
1954

Contia tenuis

May 3 Vicinity Rockville, Solano Co., Calif. M. Sorenson
brought in a specimen which had been picked up
with a load of leaf mold taken from above
locality. Actual collector probably Sorenson's boss,
the Chief of Police.

EL Karlstrom
1954

Chorina bottae

June 2 Crocker Station, $3\frac{1}{2}$ mi. E Harden Flats, 4452 ft., Tuolumne Co., Calif. One adult ♀ 3:50 p.m. (D.S.) on south-facing wooded slope under piece of partially rotted halved log $5\frac{1}{2}' \times 6" \times 4"$. Douglas fir, yellow pine, oaks, manzanita and cultivated apple trees in area. This is an old stage coach station with numerous downed frame buildings. Grassy meadow 40 yards to SE with slight rindlet flow through it. Ground beneath log slightly damp. Snake coiled in loose ball, active when picked up. Air temp. low 70's. Log was in open sun at time, but the area ^{30%} shaded by scattered trees.

June 3 Yosemite Museum, Yos. Valley. This ♀♀ "laid" (aborted) 10 "eggs" sometime between 4 p.m. yesterday and 7 a.m. (D.S.) today. I placed them on damp paper towel in $5 \times 5 \times 3$ " dish with the snake. No sign of brooding noted.

♀♀ total length 398 mm., body 346 mm. Eggs with horny light cream colored coverings. I was surprised at the heavy covering on an embryo from an ovoviviparous form. A few of the eggs adhered to each other by membranous outer portions.

Eggs measured:

L = 12.3 - 12.7 - 13.8 - 12.8 - 12.7 - 12.5 - 12.7 - 12.3 - 13.4 - 13.4

W = 7.7 - 8.4 - 8.2 - 8.7 - 7.9 - 8.1 - 8.3 - 7.7 - 8.2 - 9.0

N = 10 \bar{X} L = 12.86 mm. \bar{X} W = 8.22 mm.

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E. L. Karlstrom
1954

Chorina bottae

June 3 Crocker Station adult ♀♀ captured June 2. Light colored for a rubber boa, medium light brown above and faded yellow ventrally with a marked absence of ventral dark marks on the gasterosteges. Wayne Bryant, museum junior naturalist, told me that ^{Yosemite} Valley specimens he has seen are deeper brown above, tending toward light yellow beneath.

Room temp. where "embryos" kept (museum research room) 23.0°C . 10:30 A.M. (D.S.) at 1:45 P.M. it was 26°C .

June 6 I separated the snake and the embryos. no more "eggs" had been laid. Some external fungus growth on most of the ten "eggs". Female had turned wet towel over many of them, and they may have been too damp.

June 9 Placed lamp 16" above dish for most of a day. 8:30 P.M. scraped mold off "eggs" and placed drier parts face down on wet towels. Half look in bad shape, dry & shriveled.

June 16 more mold scraped off. all look bad.

June 28 One dissected. no embryo but reddish pigment area (germinal disc?) Egg is practically all yolk. Other 9 eggs preserved.

Mammals

E. L. Karlstrom
1954

Canis latrans

May 14 meadow $\frac{1}{2}$ mile S Govt. Center, Yosemite Valley, Mariposa
Co., Calif., 4000 ft. I pulled up along the main road
N of the meadow at 8:40 A.M. (D.S.). 60 yards S of
the road was an adult coyote almost oblivious of
passing cars and my car. The animal gingerly stalked
among the high (to 18") clump grass meadow grass,
moving forward swiftly as it apparently heard the rustle
of grass or saw movement. It moved another 50 yards
S away from the road and disappeared behind tall (10')
clumps of willow-like bushes. It then apparently
circled around my study pond and continued westward
down the large meadow. The stalking continued but
without success. At 8:55 A.M. I lost sight of the
animal among the clumps of grasses.

Lynx rufus

April 8 El Capitan meadow, 3950 ft, Yosemite Valley, Yosemite National Park, Calif. ^{10:45 A.M.} One adult cat looped along along a meadow pool 100 yards south of the road. It stopped and remained motionless watching us from a standing position as we approached to within 40 yards, the 50 feet wide pool separating us. After five minutes it ambled away from us SE 10 yards to a group of pine trees. It then took a standing position facing us on top of a deadfall tree. After a few minutes it crouched. The black and white marks on its ears were only clearly visible signs. At 10:56 the animal slowly walked away from us still in a SE direction to a heavy stand of pine 75 yards away from our position. It would walk a few yards, turn and eye us. The hind quarters and back of the legs were yellow brown, and the upper side of the short tail mostly black & brown. As the animal turned toward our station it flicked its curled tail nervously maybe 10 times and a flash of white from the underparts of the tail ~~were~~^{was} ~~highly~~ striking. The curiosity and seemingly deliberate unafraid action of the cat were striking.

